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PATHOLOGY AND TREATMENT

OF

VENEREAL DISEASES.

THE

PATHOLOGY AND TREATMENT

OF

VENEREAL DISEASES:

INCLUDING THE RESULTS OF RECENT INVESTIGATIONS
UPON THE SUBJECT.

BY

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PREFACE TO THE FIRST EDITION.

THE object in the preparation of this work has been to furnish the student with a full and comprehensive treatise upon Venereal Diseases, and the practitioner with a plain and practical guide to their treatment. In carrying out this design, theoretical discussions have been made subordinate to practical details; and, in the belief that the success of treatment depends quite as much upon the manner of its execution as upon the general principles upon which it is based, no minutiæ, calculated to assist the surgeon or benefit the patient, have been regarded as unworthy of notice.

The additions to our knowledge of Venereal, during the last ten years, have been numerous, and in the highest degree important. Among the most remarkable may be mentioned the distinct nature of the chancroid and syphilis; the innocuousness of the secretion of the chancre when applied to the person bearing it, or to any individual affected with the syphilitic diathesis; the removal of certain obstacles to a general belief in the contagiousness of secondary lesions; the fact that syphilis pursues the same course whether derived from a primary or secondary symptom, commencing, in either case, with a chancre at the point where the virus enters the system; the definite period of incubation of the true chancre, and of general manifestations; the inefficacy of the abortive treatment of syphilis; and the phenomena of "syphilization," improperly so-called, and their correct interpretation. Several of these topics are entirely new within the period mentioned, and upon others much clearer views have been obtained; so that our present knowledge

of Venereal Diseases may be regarded as far more complete and satisfactory than at any previous time. As yet, however, these results and the investigations which have led to them are, for the most part, scattered through the pages of medical periodical literature, in our own and foreign languages. To collect them into one volume, and thus render them more accessible to the American reader, has also entered into the purpose of the author.

New York, July, 1861.

PREFACE TO THE SECOND EDITION.

THE first edition of this work, the author is now free to confess, was published with many misgivings as to the reception it would receive. Presenting views directly at variance, in many respects, with those which were almost universally taught in our medical schools, and, with few exceptions, entertained by the profession at large throughout this country, it was natural to expect that it would meet with severe criticism and decided opposition; with confidence, however, in the truth of the opinions advanced, the venture was made.

Its success thus far has surpassed the most sanguine expectations of the writer. During a time of civil war, when communication with a considerable portion of our country has been suspended, and medical literature, except on military subjects, has been almost stagnant, a little more than two years sufficed to exhaust a large edition. The reviews of it, which have appeared both at home and abroad, have been in the highest degree gratifying. It has been thought worthy of translation and publication in Italy. Above all, the views set forth have steadily grown in favor; their accuracy has been confirmed by time; and they are now adopted by the chief authorities upon Venereal throughout the world.

Of the credit of this success the author would gladly appropriate to himself the share of having presented in an acceptable manner to American readers the results of modern investigations relative to Venereal, and of having thus assisted in producing in this country the same remarkable and radical revolution of opinion that, within the last few years, has elsewhere taken place. To more than this, however, he would lay no claim. It was his good fortune to be the first writer, at least in English —and, it is believed, in any language—to embody the results referred to in a comprehensive treatise. A gap existed in medical literature, which it was impossible should long remain unfilled. Others undoubtedly would soon have accomplished what he hopes to have done. He is well aware

[illegible] greater portion of the success of the work has been due [illegible] investigators, whose views are here given, and who have [illegible] out of the chaos that had for centuries prevailed. The [illegible] indicated, was so plain and simple that every mind was ready [illegible] it, and to wonder that it had not been discovered before.

The most noticeable change in the present edition will be found in the division of the work. From a certain deference to the opinions at that time generally received, the chancroid and its complications were, in the first edition, discussed in connection with syphilis. They have now been assigned, as is their due, to separate portions of the work. This change has necessitated a complete reconstruction of the second part of the first edition, and its division into two—a change which, it is hoped, will impress still more strongly upon the mind of the student the distinct nature of the two diseases referred to. The same object has been had in view in abandoning the terms "soft," "hard," "simple," and "infecting chancre," and in applying, in accordance with logical accuracy, the term *chancre* exclusively to the initial lesion of syphilis, and that of *chancroid* to the contagious ulcer of the genitals. The practical portion of the work has also undergone important alterations on various topics, among which may be mentioned the treatment of stricture by the "immediate plan" of Mr. Holt; the abandonment of specific remedies in most cases of the initial lesion of syphilis; the preference given to the external rather than the internal use of mercury in secondary and tertiary syphilis; and the necessity of trusting to nature, aided by hygienic influences, and not to treatment indefinitely prolonged after the disappearance of all syphilitic manifestations, to eliminate the virus from the system. Numerous emendations and additions of a minor character have been made; every portion of the work has been carefully revised; a number of chapters have been rewritten; several new illustrations have been added; and no effort has been spared to render the present edition a complete treatise upon the subject of Venereal, thoroughly on a level with the most advanced state of our knowledge. It will be observed that by an increase in the size of the page these additions have been accommodated without increasing the bulk of the volume.

NEW YORK, May, 1864.

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VENEREAL DISEASES.

INTRODUCTION.

THERE are three diseases, which, from their origin in sexual intercourse, have been denominated Venereal, viz.: GONORRHŒA; THE CONTAGIOUS ULCER OF THE GENITALS, or CHANCROID; and SYPHILIS. These three affections, for a long period confounded, have been, since the commencement of the present century, gradually resuming the relations which they held to each other nearly four hundred years ago. The medical mind has been travelling in a circle, and having completed the round, is now where it stood in the last part of the fifteenth and the first of the sixteenth century. The distinction between the above-named diseases which is now admitted—certainly by a very considerable number of our profession, unsurpassed in intelligence, learning, and experience, and including names which have long been acknowledged as the highest authority—was fully recognized for twenty or thirty years after Columbus discovered the new world.

The earlier history of venereal diseases has recently been very thoroughly investigated, especially by Bassereau,[1] Langlebert,[2] Chabalier,[3] and Rollet,[4] and the conclusions which have uniformly been attained, startling as they may in some respects appear, are yet supported by such an amount of proof drawn from the original sources,

[1] Affections de la Peau Symptomatiques de la Syphilis, Paris, 1852.

[2] Récherches Historiques sur la Doctrine Moderne des Maladies Vénériennes, l'Union Méd. 1855.

[3] Preuves Historiques de la Pluralité des Affections dites Vénériennes, Thèse de Paris, 1860 (No. 52). I am indebted to M. Chabalier's very able thesis for many of the following facts relating to the history of venereal diseases.

[4] Recherches sur la Syphilis, etc., Paris, 1861.

that they cannot be called in question; at all events, they have not been disproved, although Bassereau's work has been for eleven years before the profession. I propose as briefly and concisely as possible to state what is at present known upon this subject.

EARLY HISTORY OF GONORRHŒA.

Gonorrhœa has existed among all nations, and from the earliest times of which we have any record. It is clearly referred to by Moses in the 15th chapter of Leviticus, where he lays down rules for the government of those who are affected with "a running issue out of the flesh."

Among the Greeks and Romans, gonorrhœa appears to have been less common than among the Hebrews; still, unquestionable traces of it are found. Hippocrates describes five kinds of leucorrhœa, in addition to discharges dependent upon inflammation of the womb, which are mentioned separately. Herodotus states that "the Scythians made an irruption into Palestine and pillaged the temple of Venus Urania. The angry Goddess sent upon them and their posterity the woman's disease, which is characterized by a running from the penis. Those attacked by it are looked upon as accursed."[1] Celsus[2] was also acquainted with balanitis and gonorrhœa; the latter dependent, as he supposed, upon an ulcer within the urethra; and Cicero says that "incontinence gives rise to dysuria, in the same manner that high living causes diarrhœa."

At subsequent periods, this disease, and, in many instances, its complications of swelled testicle and cystitis, were described with more or less detail by Mesue[3] in 904; by Halli Abbas,[4] one of the Persian magi, who followed the doctrines of Zoroaster and wrote in 980; by Rhazis,[5] a learned Arabian physician, born in Chorosana in 852; by Albucasa,[6] another Arabian of the eleventh century; by Constantine of Carthage;[7] by Michael Scott[8] in 1214; by Gariopontus of Salerno; by Rogerius, John Gaddesden[9] of England (commencement of fourteenth century); John de Concoregio,[10] John

[1] Clio, lib. I.
[2] De Medicinâ, book vi., chap. 18.
[3] Summ. III., part 4, sect. i.
[4] De Virgæ Passionibus, Causis eorum et Signis, book ix., chap. 28.
[5] Rhazis, book X., chap. 3.
[6] Theoric. nec non Practic., tract. xxi., fol. 92 et 93.
[7] Constantinus Africanus. De Morborum Cognitione et Curatione, lib. v.
[8] Michael Scott, De Procreat. Hom. Physion., Cap. vi.
[9] John Gaddesden. Rosa Anglica, Practica Medicinæ, a Capite ad Pedes, lib. ii., c. xvii., fol. 107.
[10] Practica nova Medicinæ. Lucidur, tract. iv., fol. 66.

Arculanus, Guy de Chauliac,[1] Valescus de Tarento, John Ardern,[2] settled at London in 1371; and by many others. Since the close of the fifteenth century, when the study of venereal diseases received new impulse from the irruption of syphilis into Europe, it is hardly necessary to state that every medical writer has been familiar with the existence of gonorrhœa.

EARLY HISTORY OF THE CONTAGIOUS ULCER OF THE GENITALS.

The history of the contagious ulcer of the genitals is essentially the same. Ulcers of the genital organs and suppurating buboes are described by nearly all the Greek, Latin, and Arabian writers on medicine. Hippocrates gives very minute directions for the treatment of abscesses in the groin, dependent upon ulcerations of the womb and of the genitals. Celsus is still more explicit, and clearly describes the simple, phagedenic, serpiginous, and gangrenous venereal ulcers, which are recognized at the present day. It would be difficult, for instance, to draw up a more faithful description of the phagedenic chancroid than the following: "Ulcus latius atque altius serpit . . . . . solet etiam interdum ad nervos ulcus descendere; profluitque pituita multa, sanies tenuis malique odoris, non coacta, et aquæ similis in qua caro lota est; doloresque is locus et punctiones habet." He also alludes to the danger of destruction of the prepuce when the ulcer is complicated with phymosis, and, under such circumstances, advises circumcision. Many other names might be quoted, but it is unnecessary to adduce farther evidence upon this subject, since it is generally admitted that ulcers of the genital organs dependent upon contagion in sexual intercourse, have been known from a very remote antiquity. The only point in dispute relates to their nature.

It is maintained by some authors, and especially by Cazenave, that these were instances of primary syphilis, and not chancroids, as I have here assumed; and they have been supposed to furnish evidence of the existence of syphilis in Europe prior to the close of the fifteenth century. This idea is inadmissible for several reasons. One argument against it is the frequency of suppurating buboes with which these ulcers are said to have been attended; since in the

[1] Cyrurgia Guidonis de Chauliaco, tract. vi., doct. ii.

[2] Becket, Philosoph. Trans., vol. xxx., p. 839.

Most of the above texts have been derived from a learned work written in the last century by Gruner, and entitled: Aphrodisiacus sive de Lue Venereâ in duas Partes divisus, quarum altera continet ejus Vestigia in Veterum Auctorum Monumentis obvia, altera quos Aloysius Luisinus temere omisit Scriptores, Jena, 1789.

great majority of true chancres the inguinal ganglia which become indurated remain entirely passive; while the chancroid, on the contrary, is frequently accompanied by an inflammatory bubo terminating in suppuration. This consideration, however, will have no weight with those who do not allow, in cases of venereal sores, any prognostic value to suppuration of the inguinal ganglia; but we can well afford to waive it and base our argument upon the fact that there is no record in history of the existence of general symptoms prior to the year 1494; that the ulcer of the genitals known to the ancients was always a local affection, and never followed by general manifestations at a distance from the point of contagion; that repeated outbreaks of the disease when once apparently cured did not occur; that hereditary syphilis was unknown;[1] and finally, that the physicians who lived at the close of the fifteenth century, and who were perfectly familiar with the ulcers in question, were struck with horror and amazement at the appearance at this time of a disease which is now known to have been syphilis; confessed that they had never seen its like before, and that they were ignorant of its nature and treatment; and in their treatises upon venereal for nearly thirty years afterwards, described this and the former disease in separate and distinct chapters, thus showing that they did not entertain the least idea of their identity.

EARLY HISTORY OF SYPHILIS.

According to the most reliable contemporary authors, syphilis was first known to European nations from its appearance in Italy in the latter part of the year 1494, about the time that Charles VIII., King of France, at the head of a large army, entered that country for the purpose of taking possession of the kingdom of Naples, to which he laid claim by right of inheritance. In this expedition, which was at first favored by the Neapolitans themselves, Charles left Rome on his way to Naples Jan. 28, and was received in the latter city Feb. 21, 1495.[2] The Neapolitans soon became restive under the yoke of their new master, and, assisted by the forces of Ferdinand of Aragon, under the leadership of Gonsalvo of Cordova, the great captain, endeavored to expel the French from Italy.

Now, although the new disease probably had no necessary connection with the events just mentioned, yet the latter doubtless favored the extension and exacerbation of the former through the license and debauch attending large bodies of troops, and subse-

[1] Syphilis in infants at the breast is first mentioned by Gaspard Torello (1498).

[2] GUICCIARDINI, lib. i. cap. iv.

quently led to mutual recrimination between the natives and the invaders respecting the origin of the malady; the French calling it "Mal de Naples," because it was to them unknown before the Neapolitan expedition, and the Italians ascribing its origin to the French, and calling it the "French disease."

It is often asserted that the subsequent extension of syphilis was due to its conveyance to their homes after the close of the war by the troops which had been collected upon Italian soil. This could not, however, have been the sole, nor even the chief mode of its transmission; since the French, on their return from Naples, fought the battle of Fornovo, July 6, 1495,[1] and a decree of Emperor Maximilian I., "Contra Blasphemos," promulgated at the Diet of Worms, Aug. 7, of the same year, includes among the evils sent as a punishment against the prevailing vice of blasphemy, "præsertim novus ille et gravissimus hominum morbus, nostris diebus exortus, quem vulgo Malum Francicum vocant, post hominum memoriam inauditus, sæve grassatur,[2] thus showing that syphilis had already spread so widely in Germany as to attract general attention about the time that the French left Italy.

Joseph Grunbeck, a German physician, writing in 1496, also describes the disease as it appeared in his own person, evidently at a considerable period prior to the date of his work. This author states, as quoted by Chabalier, that he was a happy man until this new pestilence found its way into Germany; but that one pleasant day while walking in the fields, he found himself attacked with it; "et primam venenosam sagittam in glandem Priapi ista fœtidas defixit, quæ ex vulnere tumefacta, utrisque manibus vix comprehendi potuisset." Sad and dejected he returned home, undecided whether he should make known his condition to his friends; but the change in his countenance, his silence and despondency, made them suspect that some misfortune had occurred to him, and he was obliged at last to confess that he was attacked by the French disease, and to exhibit the evidences of it in his person. His dearest friends at once turned their backs upon him, and fled as if they had seen an enemy's sword suspended over their heads. Grunbeck's sadness was increased, and, retiring into solitude, he gave himself up to gloomy thoughts upon the vanity of earthly things and the ingratitude and perfidy of men. Meanwhile his disease extended, and a "thousand" ulcers appeared upon his penis and testicles and "vomited forth" bloody matter. After suffering in this manner for four months, he placed himself under the care of a celebrated empiric, who healed his sores by the

[1] Guicciardini, lib. ii. cap. iv.

[2] Goldast. Const. Imp. II. 110.

application of a powder which gave him much pain. The disease disappeared from the penis, but soon returned upon the skin, where it assumed the form of tubercles. "Pestifera qualitas ex hoc suppurato et arcto loco retrocessit, atque in multis aliis verrucas passim in cutis superficiem elisit." The skill of the most celebrated physicians was unable to dissipate these new symptoms. Temporary relief was obtained from frictions with an ointment containing mercury, which was recommended by a charlatan, but several relapses subsequently occurred.

The testimony of other authors also concurs in showing that syphilis rapidly extended in the course of a few years over the greater part of Europe, and pervaded every rank of society. As stated by John Lemaire, a poet of that period:—

Il n' espargnoit ne couronne ne crosse.

A large amount of evidence is adduced by Bassereau and Chabalier in support of the fact already mentioned that syphilis was entirely unknown prior to the year 1494. Its connection with sexual intercourse was not at first recognized, and many attributed it to the evil influences of the stars; and although a few endeavored to assimilate it to certain diseases of ancient times, as, for instance, to the "asaphati" of the Persians, the mentagra which prevailed at Rome under Tiberius, to psoriasis, elephantiasis, and lepra, yet the greater portion of the writers of that period declared that it was entirely new in the world's history, and all confessed that, so far as their own experience went, they had never seen anything like it.

For instance, Philip Beroald, who died in 1505, says that he can neither affirm nor deny the truth of the supposition that it has previously existed; all that he knows with certainty is that this "French disease, characterized by enormous prominent spots, by pustules giving the face and body a hideous aspect, sometimes painless, at other times causing the most excruciating suffering in the joints, and depriving the patient of rest and sleep at night, slowly consumes the body; that it can be cured by no remedy; that it was unknown to his ancestors; that whatever others may name it, he desires to call it morbum pestiferum diuturnum; that he prays, Dii, prohibite minas! Dii, talem avertite pestem! May this disease, more destructive than any pestilence, depart and return to the gulf of hell whence it came."

James Cataneus de Lacu-Marcino, a Genoese, in his treatise *de Morbo Gallico*, written in 1505, states that in the year 1494, under the pontificate of Alexander VI., and during the invasion of Naples by Charles VIII., King of France, there appeared in Italy a terrible

disease, which was never before known in any age; which was new to the whole world; which did not resemble the *asaphati* nor any other serpiginous and fetid ulcer, and which could not be regarded as epidemic; but which spreading over the world was due to the vengeance of God, who desires to punish fornication and adultery, which, though forbidden by law, are practised by men, who live like wild beasts.[1] The testimony of many other writers is equally conclusive.

The contagious ulcers of the genitals which were known prior to the latter part of the fifteenth century, were called "caries," "caroli," and "taroli," and the first of these terms was afterwards applied to the new disease, which, however, was distinguished as the "caries gallica." Moreover, in the works of Marcellus Cumanus, Alexander Benedictus, Leonicenus, Gaspar Torella, John de Vigo, and other authors who wrote within thirty years after the appearance of syphilis, these two affections were described in separate chapters with many of the distinguishing features that are recognized at the present day. Thus, John de Vigo mentions the induration of those ulcers which are followed by constitutional symptoms: "Cum calositate eas circumdante;" and none of the writers of this early period, when speaking of the French disease, make any allusion to suppurating buboes, which are described apart and referred to the "caries non gallica" known in ancient times. An exceedingly accurate description is also given of the cutaneous eruptions, the nocturnal pains, the bony tumors, and other general symptoms of syphilis; and notice is taken of the fact that a cure is in most cases only temporary, and that the disease often returns. Moreover, the early writers on syphilis believed in the contagiousness of general symptoms, and even of the blood of infected persons, which has recently been demonstrated by actual experiment.

ORIGIN OF SYPHILIS UNKNOWN.

None of the theories which have been advanced to account for the appearance of syphilis in Europe near the close of the fifteenth century, rest upon sufficient data to entitle them to full credence. We cannot suppose that it was of the nature of an epidemic and due to atmospheric influences, since it is expressly stated by those who witnessed its advent that it did not suddenly affect large numbers of persons of all ages, but spread from one to another, chiefly attacking the middle-aged (the very class most exposed in sexual intercourse), and sparing old men and infants, and the inhabitants of cloisters, and

[1] CHABALIER, op. cit., p. 87.

that it advanced from Italy as a centre, and occupied several years in extending to the more remote countries of Europe. Moreover our present knowledge of the disease enables us to state with confidence that it never appears except as the result of contagion.

The theory which has met with the most favor, refers the origin of syphilis to America, whence Columbus returning from his first voyage, landed at Barcelona, in Spain, in 1493, only a year before the appearance of the disease in Italy. According to Chabalier, it was stated by John Baptist Fulgosus, Doge of Venice, as early as 1509, that a new disease, communicated only by coitus, and first affecting the genital organs, had broken out in Spain, and had thence been transported to Italy, and also that it came into Spain from Africa: "Quæ pestis primo ex Hispania in Italiam allata, ad Hispanos ex Æthiopia, brevi totum terrarum orbem comprehendit." The idea that syphilis was brought to Europe from America by the sailors under Columbus was first advanced by Leonard Schmans, in 1518, Ulrich von Hutten in 1519, and Fracastori in 1521, with what evidence I shall proceed to show.

There can be no doubt that syphilis existed in the colony founded by Columbus during his second voyage, but whether indigenous to the West Indies, or brought there by the Spaniards, is unknown. Washington Irving, in his Life and Voyages of Columbus,[1] says, when speaking of the colony at Isabella: "Many of the Spaniards suffered also under the torments of a disease hitherto unknown among them, the scourge, as was supposed, of their licentious intercourse with the Indian females; but the origin of which, whether American or European, has been a subject of great dispute." Chabalier also adds the following testimony:—

Peter Martyr, Governor of Castile in 1492, states in a work[2] written in 1500: "They have in this island (Hayti) a peculiar disease, characterized by large pustules occupying the body and eating into the extremities, because they are too much addicted to luxury. This disease is contracted by cohabitation with men and women who are already infected."

Francisco Lopez de Gomare, almoner of Fernando Cortez, states that nearly all the Indians were affected with syphilis: "Los de aquesta isla Espannola son tudos bubosas, i como los Espannoles dormian con las Indias."

Rodericus Diacius Insulanus, who was physician at Barcelona at the time syphilis made its appearance, is confident that it was brought to that city in 1493 by Columbus; that the companions of Columbus

[1] Vol. i., book vi., chap. xi. [2] De Navigatione et Terris de Novo Repertis.

ascribed their disease to the privations and fatigue of the voyage; and that at Barcelona they infected the entire city, whence the disease was transported to Naples. When Charles VIII. arrived in Italy the following year, the opposing forces included a number of Spaniards affected with the disease, with regard to the nature of which they were ignorant, and which they attributed to atmospheric influences.

Laying aside all American partialities, I have thus endeavored to give a truthful statement of the evidence upon this subject; which, as the reader will observe, contains no statement from those who took part in the discovery of the new world, that they found syphilis there on their arrival. Its existence in the Indies during the second voyage of Columbus may readily be explained by its transportation thither by the Europeans, who may be supposed to have been quite willing to ascribe their disease to the natives. It is unnecessary, however, to enter into a farther discussion of this point, since I think I can assert with truth that those authors of the present day who have paid the most attention to this subject, regard the testimony in favor of the supposed American origin of syphilis as far from conclusive. Indeed, if credence is to be placed in a recent writer,[1] Chinese medical literature affords evidence of the existence of syphilis in that country and of its treatment by mercury, many centuries before the birth of Christ.

The origin of syphilis, however, is enveloped in so much obscurity that we may well say, with Voltaire, "la vérole est comme les beaux-arts, on ignore quel en a été l'inventeur."

AGE OF CONFUSION IN VENEREAL.

The views that were entertained by those who witnessed the first appearance of syphilis in Europe, and which in many respects coincided to a remarkable degree with those which have recently been advanced in the middle of the nineteenth century, gradually lost their hold upon succeeding generations, and were followed by the utmost confusion of ideas respecting this subject. A most admirable history of this "age of confusion in venereal," as it has been called, is given by Bassereau, which should be read by every one who would understand the origin of those errors from which the medical mind has but recently commenced to free itself, and which yet finds advocates among the profession. In justice to M. Bassereau, who was the first to discover the evidence afforded

[1] La Médecine chez les Chinois, par le Capitaine DABRY, Consul de France en Chine, etc., Paris, 1863.

by history in favor of the duality of the chancrous virus, I prefer to give the following extended extract from his remarks instead of a mere abridgment; and this course is the more desirable since the original discoverer is but little known in this country, and others have had the credit of his labors.[1]

"In the first part of the sixteenth century, a tendency to confound the various venereal diseases appeared. Thus, George Vella (A. D. 1508) attributed them all to the same cause. The following is his line of argument: It is conceded, he says, that before the existence of the French disease, certain women communicated to men by coitus, ulcers which were never followed by that assemblage of symptoms which make up the new disease. But it is also certain that the latter commences with ulcers upon the genitals, which are contracted in the same manner from diseased women, and have the same objective symptoms (quoad sensum visûs) as the ulcers of the penis anterior to the appearance of the French disease, so that the most skilful physicians cannot distinguish them. If, then, these ulcers are contracted in the same manner, have the same aspect, and cannot be distinguished from each other, why not refer them to the same principle? Vella admits that it may be objected that a new effect presupposes a new cause, and that since the French disease was never observed before, it must be produced by some other cause than the one to which we refer the contagious ulcers of the genitals which have been known in all ages. In answer to this objection, he replies, that the causes of disease may at times assume a greater activity, just as we see pestilential fevers produce greater ravages at certain periods than at others, while yet the cause remains the same.

"It may also be objected, he says, that the necessity of new remedies indicates a difference in the nature of the disease. He replies, that it is indeed true that the remedies employed to cure the ulcers anterior to the French disease, are insufficient for the new disease, but that the means which are efficacious in the latter, will also cure the former. This is equivalent to saying that the remedy of a severe disease is generally sufficient for a light disease, while the remedy of a light disease is not always the one required for a grave disease.

[1] In conversations with American physicians, I have been surprised to find many who were entirely unacquainted with the name of M. Bassereau, and who attributed the honor of producing the first proof in favor of the distinct nature of the chancroid and syphilis to M. Clerc, whose views, differing from Bassereau's and now known to be incorrect, were published two years later than those of the last mentioned author.

"George Vella, therefore, very clearly establishes the fact, which we have seen to be apparent in the writings of Alexander Benedictus, Marcellus Cumanus, and John de Vigo, viz., the existence of contagious ulcers, the effects of which were confined to the genital organs, before the year 1495, and the appearance about this period of a new disease, which commenced upon the private parts in the form of ulcers, which were soon followed by general cutaneous eruptions, pains in the joints, etc. In addition to this — and the idea is entirely his own — he endeavors to show that these two affections are dependent upon the same cause.

"It was not irrational nor inconsistent with pathology in Vella, to consider the new ulcers of the genitals which affect the whole system, as of the same nature as the local ulcers which were known in all ages, and to suppose that the latter had suddenly assumed an unusual activity under the influence of some peculiar state of the constitution. Unfortunately, his theory rests only upon two very contestable facts: 1. The identity in their mode of transmission. 2. Their striking resemblance and the impossibility of distinguishing between them. But it is evident that the same mode of communication in two diseases does not prove their nature to be the same; and Vella's supposed similarity in the appearance of all chancres had already been refuted by his predecessors. In fact, most preceding authors had agreed in their statements, that the ulcer which was followed by general symptoms, could be recognized by its livid aspect and its hard and indurated base; and this ulcer appeared to them so different from the ordinary venereal sore that in their works upon venereal, they described it in separate books or chapters.

"The writers on syphilis, whose testimony I have adduced in opposition to Vella's, did not say that the ulcer of the French disease always presented decided special symptoms; nor do I myself attempt to sustain this opinion. In one of the preceding sections, I have shown that the characteristic induration is wanting in a number of venereal sores, followed by syphilitic erythema.

"The doctrines professed by George Vella induced neglect of the study of the special symptoms of venereal ulcers, and greatly contributed to introduce confusion with regard to them. This confusion, however, was especially the work of those physicians, who had commenced the practice of their art subsequent to the year 1495. and who, therefore, were unable to compare the new disease with the venereal affections which had prevailed from time immemorial, before the close of the fifteenth century. In following the change which took place, we find that the first step was to make no distinc-

tion in their writings between the old and new ulcer, and to include in their descriptions of syphilis certain complications which belong almost exclusively to the ancient variety. Thus Nicholas Massa (1532), the author of a celebrated treatise on the French disease, includes among the unequivocal symptoms of this affection, suppurating buboes, which attend almost exclusively the ulcer of the ancients. Yet it had not escaped the observing mind of Massa, that sores followed by suppurating buboes are rarely succeeded by cutaneous eruptions and other general symptoms; so that, after speaking of these buboes as a symptom of true syphilis, he is obliged to confess that patients who have them are generally exempt from the eruptions and pains which constitute the French disease. 'Et sequuntur apostemata inguinum quæ si suppurantur removent ægritudinem.' Matthiolus (1535) also includes suppurating buboes among the symptoms of the French disease. Antony Lecoq (A.D. 1540) speaks of them in the same terms as Nicholas Massa; whilst Fracastorius (A.D. 1530) and Sebastian Montius, both witnesses of the appearance and progress of syphilis, continue to describe this disease (the former in a special treatise, the latter in his 'Dialexeon' published in 1537, when he was eighty years old), as was done by Marcellus Cumanus, Benedictus, Leonicenus, Gaspar Torella, and many others, without including suppurating buboes among its symptoms.

"As the venereal ulcers of the ancients, and its attendant suppurating bubo, began to be included among the symptoms of syphilis, treatises on surgery ceased to contain those special chapters in which contagious ulcers of the genital organs and inguinal abscesses had heretofore been described. Discharges from the urethra were also included among the symptoms of syphilis, and still farther modified the tableau. Finally, in the descriptions given of the French disease, not only were symptoms inserted which were completely foreign to syphilis, but the regular course of this affection was entirely forgotten.

"This confusion was rendered complete by Anthony Musa Brassavolus. This physician, who was a laborious student rather than a sagacious observer, seems to have made it an object of his treatise upon the French disease, published in 1551, to collect together all the errors of the writers upon syphilis of this period, and to add others of his own invention. Not only did he include all venereal affections under the head of syphilis, but, as described by him, this affection lost its characteristic physiognomy, and was a mere collection of symptoms succeeding each other without order or regularity.

According to this author, buboes may appear before chancres upon the penis; syphilis may commence indifferently as an exostosis, an eruption upon the skin, pains in the bones, or falling out of the hair and teeth. He goes so far as to admit eight primary symptoms, which he calls the simple forms of the disease, and which by their union in various ways may give rise to an infinite variety of combinations, which he terms the compound forms of syphilis, and limits to two hundred and thirty-four in number.

"Brassavolus, it is true, did not escape severe criticism. Gabriel Fallopius, his pupil, called his views 'futile inventions,' and Joseph Scaliger did not hesitate to say that Brassavolus was the echo of the vulgar herd of physicians of his day: 'Cymbalum ineptæ medicorum plebis.' But error, especially when sanctioned by a great name, is a source of great danger, since many minds are wont to accept the opinions of others without criticism, and to study books rather than nature. The doctrines of Brassavolus, therefore, were not without influence; and if we except the excellent treatises of Fernel and Leonard Botal, most of the works upon syphilis that appeared during the two following centuries, were more or less tainted with these doctrines. Even at the present day, since the publication of the writings of Hunter, and his annotators, we have still a school of Brassavolus. To be convinced of this fact, it is only necessary to read what has been published on syphilis since the commencement of the nineteenth century.

"Yet, after the time of Brassavolus, the syphilitic ulcer, on account of the induration of its base, was still considered by some writers as distinct from the ulcer which is not succeeded by general symptoms. Thus Fallopius (A. D. 1555) devotes the eighty-first chapter of his treatise upon the French disease to the purpose of showing that there are several species of venereal sores; that there is a great difference between the 'caries gallica' and the 'caries non gallica;' that the former precedes the French disease, and has no connection with the latter, which is described in the writings of ancient and also in those of modern physicians prior to the year 1495.

"After Fallopius, Antonius Fracantianus (1564), a celebrated professor at Bologna, also says that the sore which precedes general syphilis, may always be distinguished with ease from the one the action of which is local. 'Siquis carie afficiatur norunt non tantum chirurgi, sed et inepti tonsores, num caries illa gallica sit nec ne; hoc vero non nisi ab exustione et sorditie, quæ livido vel nigro colore, et ex callositate innotescit.'

"Again, Nicholas de Blegny, in 1673, speaks of the indurated

chancre; but, unlike preceding authors, does not regard it as a distinct species, but as an indication that the general symptoms of syphilis are likely to follow; and, in this respect, his views agree with those of Ricord at the present day." [As the reader is probably aware, Ricord has since adopted the distinct nature of the two species of venereal ulcers.]

"After the venereal affections which had been known in ancient times had thus been confounded with the disease which appeared at the close of the fifteenth century, and after the natural history of syphilis had been completely lost sight of under the supposition that the variations in the symptoms produced for the most part by treatment were really modifications in the course of the disease, an incident occurred which is worthy of attention, and does not require comment. Physicians perceived that the recent descriptions of syphilis did not coincide with those given by the authors who had witnessed the earliest appearance of the disease in Europe; and as it was impossible to suspect that the earlier writers had omitted gonorrhœa and suppurating buboes, which were now regarded as the most frequent and positive indications of syphilis, they supposed that the type of the disease had changed, and that since its first appearance new symptoms had been added. Thus Brassavolus says that gonorrhœa was not a symptom of the French disease until about 1520; and Gabriel Fallopius, writing in 1555, that the same disease appeared fifteen years before as a new symptom of syphilis, the Protean nature of which is thus apparent. 'Ultimum signum est gonorrhœa gallica, signum incipientis morbi quæ nobis indicat istius Protæi naturam.' Yet Alexander Benedictus had written more than fifty years before, that gonorrhœa, which had been known in every age, had become as it were epidemic since the appearance of the French disease; still, the assertion of Brassavolus and Fallopius prevailed, and, repeated by most succeeding writers on syphilis, became, so to speak, a classic dogma.

"Buboes were also considered of more recent date than the other symptoms of syphilis, and their origin was referred to the year 1514, because at that time they were first included among the manifestations of the French disease by Nicholas Massa.

"These pretended changes in the disease were the foundation of the fabulous 'periods' or 'epochs' of syphilis, invented by Astruc (A. D. 1736), and composed of various elements, among which are found: 1. The symptoms of those venereal affections which existed prior to syphilis and were successively annexed to it; 2. Certain symptoms belonging to syphilis, as the late form of alopecia and

exostoses, which generally appear several years after infection, and which consequently did not figure in the early descriptions of the French disease which were written before the close of the fifteenth century; 3. Certain symptoms, as pustular eruptions, which were very prominent on account of their frequency and intensity for some years, but which were afterwards supplanted in a measure by other manifestations of the disease which at an early period were quite uncommon, but which subsequently acquired a great degree of importance; I refer to gummy tumors, which, according to Fracastorius, were very frequent about the year 1540.

"In all these 'periods' of Astruc, only one fact is supported by medical tradition, and that is the gradual diminution in the intensity of syphilitic symptoms, which is attested by many reliable authors, and which is evident to any one who compares the frightful descriptions of this disease which were written in the latter part of the fifteenth century, with those which appeared twenty years later, or with others which have been published in our own day.

"The modifications of the doctrines professed by those who witnessed the first appearance of syphilis in Europe, could not fail to affect the treatment of venereal diseases. Before the year 1495, ulcers of the genital organs, the suppurating buboes dependent upon them, the various forms of vegetations and discharges from the urethra, were considered as purely local affections, and treated by means of local remedies. As soon as the French disease appeared, the insufficiency of all topical applications in the treatment of the new disease was manifest; but human ingenuity, never more fertile in resources than under circumstances of great necessity, soon discovered in mercury a powerful modifier of the new complaint. For several years this remedy was employed in the form of frictions, and only in case the patient had broken out with an eruption following a sore upon the genital organs; but it soon became the custom to resort to mercurial inunction immediately after contagion and during the existence of the primary sore, with a view of preventing the appearance of general symptoms. This practice was first recommended by James Cataneus, who thought that the same remedy which cured the pustular eruption would also prevent it. 'Hæc enim onctio, absque dubio, tale destruit virus quod enim unam sanat ægritudinem, ab eâdem præservat.'

"This wise precept, to employ mercurial medication during the existence of the primary sore for the purpose of preventing a general eruption, soon gave rise to the most serious errors; for, about the time that it was given, physicians began to ignore the distinction

between the two species of ulcers, and were consequently led to treat them all indiscriminately with mercury. This injurious, not to say barbarous practice, has been continued to the present day, and has led to an exaggerated estimate of the powers of mercury, which, for three centuries, has been given to a multitude of patients, who have been supposed to be preserved through its influence from symptoms of which they stood in no danger.

"Hence we may explain the success of all those modes of treatment which charlatans have endeavored to substitute for mercury when given during the existence of supposed primary symptoms, as a prophylactic against secondary manifestations; since, if the same treatment, no matter what, be applied without distinction to patients with gonorrhœa, ulcerations, and buboes, there will always be a large proportion who will escape farther trouble, for the simple reason that their symptoms do not belong to the disease which first appeared in the fifteenth century, and are, therefore, incapable of infecting the general system."

Probably no cause contributed more powerfully to the production and continuance during three centuries of confused ideas respecting venereal diseases than the fact that they are usually transmitted in the same manner, viz., by sexual intercourse. As already seen, this was a strong argument with George Vella in favor of their dependence upon one and the same poison; and it may well be doubted if it has entirely lost its weight at the present time. And yet it requires but a moment's thought to be convinced that this is the shallowest possible foundation upon which to build a theory as to the nature of any disease; for if identity in the mode of communication proves identity of species, we must regard all those affections which are conveyed through the medium of the air, or, in other words, the whole tribe of epidemics, as constituting one disease; those which are communicated by contact, as the itch, favus, etc., another; and so on, making as many species as there are ways of transmission.

As Rollet has ably shown,[1] the communication of gonorrhœa, the chancroid, and the initial lesion of syphilis in the sexual act is merely an accidental circumstance, and due to the fact that these diseases are capable of affecting the genital organs which are brought into such frequent and intimate contact. The conditions

[1] De la Pluralitié des Maladies Vénériennes, Gaz. Méd. de Lyon, No. 7, Apr. 1, 1860. It is probable after all that the yaws and radzyge, as well as a number of other contagious diseases hitherto supposed to be peculiar to certain localities, are nothing but syphilis. See Rollet, Recherches sur la Syphilis, etc., Paris, 1861.

during coitus are in the highest degree favorable for contagion to take place; and all contagious diseases, the active principle of which is fixed and not volatile, which find their natural habitat in man, and which are capable of affecting the genital organs in the two sexes, are frequently transmitted in this manner. The only diseases of this latitude which fulfil these requirements are gonorrhœa, the chancroid, and syphilis; while "in those countries in which other contagious affections, as the yaws and radzyge, foreign to our own climate, exist, they also are communicated in sexual intercourse, and are, strictly speaking, venereal." Scarlet fever, variola, measles, and other contagious diseases dependent upon a volatile poison, are naturally transmitted by way of the respiratory organs. Hydrophobia, glanders, vaccinia, etc., are not natural to man; and those contagious diseases which depend upon the presence of a parasite, as the itch, favus, and herpes tonsurans, are incapable of affecting mucous surfaces.

This is not the only mode of transmission of veneral diseases, since gonorrhœal inflammation is not unfrequently communicated from one eye to another through the medium of the conjunctival discharge conveyed upon towels and other articles in common use; and the secretion of the chancroid and of the lesions of true syphilis, whether primary or secondary, is contagious when properly applied, by whatever means, to any part of the body. In infants, the frequent and intimate contact of nursing takes the place of that during coitus, and the most common mode of transmission of venereal diseases is through the medium of the breast; while even in adults syphilis is not unfrequently contracted from a primary or secondary lesion situated upon the mucous membrane of the mouth, tongue, or fauces

GONORRHŒA AND SYPHILIS DISTINCT.

Our review of the history of venereal diseases has incidentally furnished us with proof that gonorrhœa and syphilis are not dependent upon the same poison by showing that they have originated at different periods, the former being known in all ages, the latter only since the close of the fifteenth century; but the *chief* evidence of the distinct nature of these affections, like that of all other diseases, is to be found in clinical observation. We infer that intermittent fever is different from whooping-cough, the smallpox from rheumatism, phthisis from the measles, etc., because the symptoms, course, termination and susceptibility to the action of remedies, in each, are different. And yet, in none of the diseases mentioned, is the difference greater than between gonorrhœa and syphilis; the

former being characterized by the symptoms of catarrhal inflamma tion common to mucous membranes, not infecting the general system, exposed to complications which are for the most part seated in organs which hold direct communication with the urethra through the medium of a mucous surface — as, for instance, the testicle, bladder and prostate, amenable to local treatment, and terminating in resolution and a complete restoration to health; the latter disease commencing with an ulcer followed by a long category of general symptoms, its complications usually seated in the lymphatic system, mercury and iodine its chief remedies, its effect upon the constitution, if not permanent, at least of long duration.

And let it not be objected to this argument, that the premises assume what it is attempted to prove. Nothing has been assumed, but a simple statement given of the results of clinical observation. The differences which I have mentioned characterize the two diseases in the great majority of cases, as every one will admit; and the general testimony afforded by the symptoms, course, and termination is, in all diseases, considered sufficient to establish their distinctive character. In the exceptional cases, in which one disease appears to run into another, we seek and are generally able to find an adequate explanation, although in some instances we fail; but we do not, therefore, infer that the line of demarcation between them should be entirely effaced.

Let any one follow out a series of cases of gonorrhœa *from their commencement*, assuring himself that the constitution is not already infected with syphilis from previous exposure, making a careful examination for the purpose of ascertaining that no chancre is present upon any part of the body, and keeping the patient under observation, in order to be sure that no primary sore is subsequently contracted, and it may safely be asserted that the investigation will satisfy any candid mind of the distinct nature of gonorrhœa. In all the reported cases, with scarcely an exception, which have appeared to favor a belief in the identity of gonorrhœa and syphilis, the mode of investigation has been exactly the reverse of the above. The patient has not been seen by the surgeon until general symptoms have appeared, and the only knowledge of his previous history has been derived from his own lips. Now, such cases are entirely valueless, for the simple reason that a patient is an incompetent witness upon a subject with regard to which, unless a medical man, he is necessarily ignorant. He may state, with perfect honesty, that his only previous symptom has been an attack of gonorrhœa, and yet he may, without knowing it, have had a chancre within the

urethra, or even upon the external surface of the genitals (since the superficial form which a chancre most frequently assumes, may be attended by such slight symptoms as entirely to escape observation), or a primary sore may have been situated upon some remote part of the body, and, consequently, its character not have been suspected, and, in many instances, careful inquiry and examination will show that one of these suppositions is true. There are also other sources of error too numerous to dilate upon here, but which will receive due consideration hereafter. Now, with these facts before us, and even granting, in some cases of general syphilis, apparently commencing with a discharge from the urethra without appreciable ulceration, that no plausible explanation can be discovered, which is the more probable; that such explanation really exists, or that nature in disease belies herself by contradicting in a few rare instances what she is constantly teaching in unmistakable terms in the overwhelming majority?

Ricord thought to find additional proof of the distinct nature of gonorrhœa and syphilis in artificial inoculation. He inoculated the discharge of the former upon the patient and the result was negative; the same experiment, performed, as he supposed, with the secretion of a chancre, was successful; whence he concluded that artificial inoculation upon the person affected, would enable us to distinguish between the urethral discharge of gonorrhœa and that from a concealed chancre. He has since discovered that a true chancre is not auto-inoculable, and, consequently, that his successful inoculations upon the individuals from whom the matter was taken must have been performed with the virus of the chancroid. It follows, therefore, in respect to capability of inoculation upon the patient himself, that a chancre is precisely upon the same footing as gonorrhœa; neither one nor the other is auto-inoculable; and hence this test, at one time much insisted upon by Ricord, though not original with him, is proved fallacious.

For all practical purposes, the idea that gonorrhœa is identical with syphilis is exploded; for although, in some works upon venereal, this error still retains the form and proportions which it assumed for three centuries, it is a corpse without life; since, however its friends may preach, it would be difficult to find one among them who puts his principles in practice, and treats gonorrhœa with mercury. Diday[1] has adduced the testimony of three of the Internes of the Hôpital du Midi in proof of the fact that Vidal, one of the

[1] Nouvelles Doctrines sur la Syphilis, p. 100.

strongest advocates among recent writers of the syphilitic nature of gonorrhœa, invariably treated this disease as a simple inflammation without mercury.

THE CHANCROID AND SYPHILIS DISTINCT.

The separation of gonorrhœa from syphilis had for many years been received as beyond dispute, while the contagious ulcer of the genitals and that constitutional disease which was first known in Europe about the year 1494, were still confounded under the name of syphilis and regarded as modifications of one and the same affection. In 1852, however, the discovery was announced that the latter diseases are as radically distinct as the former, and that they bear no resemblance to each other except in their most frequent mode of transmission by sexual intercourse. The great revolution in medical belief upon this subject which, in the few years that have since elapsed, has been constantly gaining adherents, and which even now, I do not hesitate to say, is supported by the greater weight of authority throughout the world, requires more than a passing notice. We may first, however, with both interest and profit, recall some of the glimmerings of this truth which had already crossed the minds of certain careful observers.

It had for a long period been a matter of common observation that some venereal ulcers, even when not subjected to treatment, were limited in their action to the part upon which they were situated and its immediate neighborhood; while others were attended by infection of the general system. Mr. A., for instance, would have a sore upon the penis and a suppurating bubo in the groin, but, after these were healed, no further trouble; while Mr. B. would contract an ulcer, which would be followed by a train of general symptoms, extending over a period of years, and perhaps affecting his offspring. This remarkable difference was explained on the ground of a diversity in the constitutions of the two individuals. The seed was supposed to be the same in both cases, but some peculiarity of soil in which it was implanted produced a different mode of germination. There was an unknown something in the system of Mr. A. which protected him from constitutional infection, while the absence of the same in Mr. B. exposed him to it. If either of these men should communicate his disease to a woman, her sore, it was thought, would be attended by systemic syphilis or not, according to her peculiar idiosyncrasy, and independently of the source from which the virus came.

The unsatisfactory nature of these views had attracted attention

and awakened doubts of their correctness in the minds of several surgeons. Hunter devotes Part VII. of his work on Venereal to a consideration of "Diseases resembling the Lues Venerea, which have been mistaken for it," and which he is often evidently at a loss to classify. But although frequent misgivings as to the correctness of his views are to be found in his writings, he still maintained that "there is no difference in the kind of matter, and no variation can arise in the disease from the matters being of different degrees of strength; the variations of the symptoms in different persons depend upon the constitution and habit of the patient at the time."[1] Abernethy was also at a loss to account for many syphilitic phenomena, and especially for the development or non-development of general syphilis after venereal ulcers which closely resemble each other. In his work entitled "Surgical Diseases resembling Syphilis," when speaking of venereal ulcers, he says: "It is from their effects upon the constitution alone that we can judge whether they are syphilitic or not." (p. 59.)

Carmichael,[2] in 1814, took a decided stand in favor of a plurality of poisons, of which he admitted four, but he believed that they were all capable of affecting the constitution, though some were susceptible of spontaneous cure without mercury. The distinctions which he drew were grounded more upon the character of the eruption than upon the appearances of the ulcer, as will appear from the following summary:—

"1. The scaly eruption which appears under the form of lepra and psoriasis, and terminates in ulceration, is alone produced by the syphilitic primary ulcer, characterized by its slow progress, and its indurated edge and base; and we find that both local and constitutional symptoms yield with almost invariable certainty and celerity to the action of mercury.

"2. The papular eruption which terminates in exfoliation of the cuticle may either be occasioned by the smooth superficial ulcer, without induration or ulcerated edges, or by a purulent discharge from the surface of the glans and prepuce (balanitis); or, thirdly by a gonorrhœa virulenta; and we have found that these different species of the same disease are alike capable of a spontaneous cure, or of being removed by external astringent applications; and that the constitutional disease they produce, is, like the primary, also capable of a spontaneous cure, which is promoted by antimony and decoctions of the woods.

[1] Ricord and Hunter on Venereal, 2d edition, p. 47.

[2] Essay on the Venereal Diseases which have been confounded with Syphilis.

"3. The pustular eruption which terminates in ulcers, covered by crusts, is either occasioned by the phagedenic or sloughing ulcers. These distinctive venereal complaints, in their primary stage, are best treated by such means as subdue inflammation and symptomatic fever, and by anodyne medicines, such as cicuta and opium. In their secondary stages, the decoctions of the woods, antimony, and mercurial salts, in alterative doses, are the means most to be depended upon; but change of air, and such measures as may tend to strengthen the constitution, are also of unquestionable moment.

"4. The tubercular eruption which terminates in deep, irregular ulcers, has been traced, *in one instance only*, to a primary sore, which from the manner it undermines the skin, has been named the burrowing ulcer. But until other cases concur to demonstrate this connection, it would be premature to conclude that the one always occasions the other. The treatment is the same as for the phagedenic ulcer.

"5. The diseases likely to be confounded with syphilis, which arise spontaneously from a disordered state of the constitution, frequently assume the form of the tubercular eruption. But after ulceration, the sores do not continue so extensive, jagged, and obstinate, and particularly under the means recommended, as those of venereal origin. Treatment: nitrous acid, the woods, and alterative doses of mercury."

These views were never generally adopted, even in Dublin, where Carmichael resided, and after a brief notoriety were almost entirely forgotten.

But Ricord appears to have had the clearest anticipations of the discovery which was destined to emanate from his "school," or from among his pupils and followers. In the absence of proof to the contrary, this surgeon advocated, in general, the unity of the syphilitic virus, and explained its different effects on the ground of constitutional differences already referred to; but Mr. Victor de Meric[1] states that Ricord remarked to him many years ago: "You may rest assured that some day distinct origins will be found for the infecting and non-infecting chancres;" and in the first edition of his Letters on Syphilis, published in 1851 (p. 257), when referring to the fact that in experiments upon syphilization, inoculation of the matter of chancroids had always produced chancroids, while in the single instance that pus from a true chancre had been employed, a true chancre was the result, this author says: "If these results were

[1] Lettsomian Lectures, 1858, p. 9.

constantly obtained, we should be forced to conclude, that there are differences in syphilis which do not depend alone upon the condition of the individual upon whom the cause acts, but upon differences in the cause itself."

With this brief history of opinion regarding this important question, we come down to the year 1852, when the first successful assault was made on the old doctrine of idiosyncrasies and temperaments, and led to its final overthrow and the establishment of the duality of the chancrous virus. At this time, M. Bassereau, a former pupil of Ricord, published his "Traité des Affections de la Peau, Symptomatiques de la Syphilis," a work characterized throughout by such originality of thought and accuracy of investigation that its perusal is essential to every one who would be thoroughly informed on venereal diseases. Although nominally a treatise upon syphilitic eruptions alone, many other subjects connected with syphilis are discussed, and among them the unity or duality of the virus, hitherto regarded as one. Justice to the author, the intrinsic and historical interest of his remarks, the manly and cogent style of his reasoning, and the absence, so far as I am aware, in the English language, of any suitable exposition of his views expressed at this early day, demand a somewhat extended quotation, which I shall give in the form of a free translation, with such abridgment as my limits as to space require.

It is necessary to premise that this question is discussed by M. Bassereau in his chapter on syphilitic erythema, which, being one of the earliest symptoms of general syphilis, affords a better opportunity for tracing the connection between primary and secondary lesions than any other. The cases of erythema, to which frequent reference is made, number 170, if we exclude twenty-eight in which the absence of information regarding the primary ulcer precluded any comparison.

In the tenth section of the chapter upon this subject, entitled: "Recherche des causes qui ont pu déterminer le développement de l'erythème, c'est-a-dire la généralization des symptômes syphilitiques dans l'économie," M. Bassereau says:—

"There can be no question of the fact that there are venereal ulcers which may be treated by the most simple remedies without the employment of any mercury whatsoever, and yet never be followed by the symptoms of general syphilis. Any one may convince himself of this truth by inquiring of old men, many of whom will state that they had venereal ulcers several times in their youth, which were treated with simple cerate, lint, or other means

destitute of specific action, and, though they have never taken mercurials, there has not been the slightest appearance of constitutional syphilis during the thirty or forty years which have since elapsed. Many persons also will repeatedly have ulcers and escape infection, but will finally contract another which will be followed by a syphilitic eruption. Why this difference? What should limit the action of the sore in the one case and in the other extend it to the whole system? This is an interesting problem, and I will proceed to give the results of my attempts to solve it. Let no one who is wont to pay respect to opinions which have received the stamp of authority take umbrage at the novelty of the propositions which I am about to present, or be hasty in rejecting them. The question at issue is so important that it deserves serious examination. It is not to be decided by an appeal to the vague impressions left on the mind by former experience, or by the doctrines of this school or that; it can only be settled by new investigations undertaken for the very purpose. I ask therefore of unbiassed men to devote the necessary time to verify the facts which I am about to present, and to give them their most scrupulous attention.

"Among the causes which I have investigated, I have endeavored to ascertain if age has any influence upon the infection of the system by syphilis, and I have satisfied myself that it has none. From birth to the most advanced years, men may have sores which, at any age, may be followed by general syphilis; and though infection is more common among the young, it is simply because they are more exposed. Sex is equally devoid of influence. Ricord states that venereal ulcers are less frequently indurated in women than in men, which is equivalent to saying that women are less liable to syphilis, since it can be easily shown that infection attends in most cases indurated chancres. I do not believe, however, that Ricord carries the induction thus far. For my own part, I think that the rarity of induration in women is only apparent. Indeed, in an examination of the same number of venereal ulcers in the two sexes, I have found nearly the same proportion indurated in the one as in the other; with this difference, that the induration was generally poorly marked on the vulva, while it was very decided upon the penis. Just as the skin of various parts of the body is not equally susceptible of the development of induration, so this symptom is less frequent upon the genital organs in women than in men. But women are not on this account less exposed to syphilis. Though fewer persons of this sex are affected with this disease, it is because the number who are addicted to debauch is incomparably

less than of men; whence venereal affections of all kinds, syphilis included, are less common among them, and the difference cannot be attributed merely to sex.

"Again, idiosyncrasy will not explain the fact that a sore is only local in its effect in one person, while in another the system at large is contaminated. This is proved by the number of persons who, after having numerous simple ulcers, contract another which becomes indurated and is followed by general manifestations.

"Can such different results from two acts of contagion by a virus reputed the same be accounted for by the changes which frequently take place in the constitution, and by virtue of which a man is not affected in the same manner by the same agent at times very nearly approximated? Doubtless such dissimilar effects might depend upon the particular disposition existing at the time of contagion; but this explanation is admissible only in default of a better, especially as it is opposed to what we know of the action of specific causes, which always tend to produce the same results.

"I have carefully studied the temperament and constitution of persons affected with syphilitic erythema, in order to discover if any one of these organic modifications of the system might not influence the development of syphilis, but such inquiry has led to no positive result. I have found all temperaments affected in nearly equal proportion; none can therefore be regarded as peculiarly conducive to the extension of the virus throughout the economy; and the same may be said of difference of constitution.

"An insufficient amount or the bad quality of food, which is a powerful aggravating cause of syphilitic symptoms, has been so rarely observed in the cases of erythema which have come under my notice, that it is impossible to ascribe to it the development of general syphilis. The abuse of alcoholic stimulants, changes of temperature, and intercurrent diseases appear to have had no more effect. I have merely noticed that chancres contracted during warm weather are more rapidly followed by syphilis than during cold.

"The above remarks clearly show that neither age, sex, idiosyncrasy, temperament, constitution, hygienic influences, nor coexisting diseases which might be supposed to have depressed the system at the time contagion took place, can, each by itself, be regarded as the determining cause of infection; and if we group them all together instead of considering each singly, my statistics will show that they will not account for one-third of the cases of constitutional disease. The better to appreciate the etiological value of these influences, I have examined the condition of those persons whose ulcers, in spite

of the absence of all treatment capable of retarding or destroying a tendency to secondary symptoms, have not been followed by general syphilis. I have compared one hundred such cases with an equal number of patients affected with syphilitic erythema, and have found in each nearly the same proportion of lymphatic temperaments, feeble constitutions, bad hygienic influences, etc., thus confirming my opinion of the necessity of searching for other than physiological and hygienic causes of the generalization of syphilitic manifestations.

"I have also sought for the solution of this question in the sore itself. I have endeavored to ascertain if repeated acts of contagion might not favor the appearance of secondary symptoms. On examination of the cases cited, I found that in 112 cases the eruption appeared after several successive ulcerations, and in 86 after a single one. Notwithstanding the predominance of the former, it cannot, I think, be admitted that repeated attacks are the cause of constitutional infection. The idea that the action of a virus must be accumulated to produce its utmost effect is but little in accordance with the medical knowledge we already possess. In a number of my cases, also, there was so long an interval between the ulcers that it appears to me difficult to attribute to the first contagion any influence whatever in the production of the syphilitic manifestations which followed the last exposure.

"Again, I have inquired if individuals affected with several ulcers at one time, were not more exposed to constitutional infection than those having only one, and who consequently bore upon their persons a smaller surface secreting contagious matter; but I found this could not be the case, for of the 170 instances of syphilitic erythema, 141 had had but one, and only 29 multiple ulcers; whence I conclude that neither the plurality of the sores nor the extent of the secreting surface can be regarded as the cause of the constitutional manifestations which sometimes appear. These results are analogous to those obtained by Kirkpatrick, Dimsdale, and Gatti in experiments with the virus of variola, from which it appears that there is no connection between the number of inoculated points and the copiousness of the consecutive eruption. Girot even observed that the eruption of variola was milder and more discrete after inoculating in six places than when only two punctures were made.

"An analysis of these cases of syphilitic erythema also shows that the development of general syphilis is not affected by the situa-

tion,[1] degree of ulceration, or duration of the sores. General symptoms may supervene, on whatever part of the body the sore is situated; and the intensity of the former is not increased when the ulcer is at a distance from the genital organs, as was once supposed by Bœrhaave. A decided tendency to extend by ulceration is also innocent of the development of constitutional syphilis; for I have often seen the mildest and most superficial erosions followed by infection, while phagedenic sores proved innocuous. Those ulcers which last for a long period are not more likely to terminate in secondary syphilis than those which cicatrize within a moderate or short space of time, as may also be seen from an examination of these 170 cases.

"On the other hand, induration is so frequent a symptom of these ulcers[2] that it is impossible not to admit that it bears an intimate relation to the syphilitic erythema which ensued. But even if it could be shown that all chancres are indurated, must we necessarily say that induration is the cause of infection? By no means; for this would only be avoiding the question instead of solving it, since the cause of the induration would still remain to be discovered.

"Finally, in my investigations I have endeavored to ascertain if any relation existed between the symptoms presented by my patients and those of the persons from whom they contracted their disease. Such inquiry is often difficult, for men are frequently infected by women whom they never see but once, and of whose name and address they are ignorant. Some have intercourse with several women within a short time preceding the appearance of the sore, so that the source of the virus is doubtful; others refuse to give any information with regard to the persons with whom they have had connection. In some cases, however, we are able to compare the symptoms in the two sexes. Patients often bring to me for examination the women who infected them, or else put me in the way of visiting them at their homes. Frequently, also, at the Hôpital des Vénériens, I have found two or three, or even a larger number of men who contracted their disease from the same woman, either on the same day or at a few days' interval. Finally, in several instances I have seen both a wife and a husband, and even their children, all affected with syphilis which had been introduced into the family through one of its members.

[1] At the time this was written, the fact that chancroids are rarely met with upon the head or face was not known.

[2] Of the 170 chancres, 157 were known to be indurated; in 13 induration was doubtful.

"These repeated confrontations of persons infected by each other — undertaken at first to determine what syphilitic lesions are contagious and what are not; to show what symptoms may succeed others, and what modifications the same symptom may undergo by transmission between individuals of different sex and temperament — have led to the discovery of that hitherto mysterious cause by virtue of which venereal ulcers sometimes limit their action to the part on which they are situated and the neighboring ganglia, and at other times extend their effect to the system at large and are followed by general syphilis. The following propositions embody the results obtained from the confrontation of patients affected not only with erythema, but also with other syphilitic eruptions and primary sores, with those persons from whom their disease was derived:—

"If we compare persons who have had venereal ulcers followed by general symptoms with those persons who inoculated them, or with those whom they in turn have inoculated, we find that all, without exception, have had constitutional syphilis; never, in any case, has the action of the sore been merely local.

"On the other hand, by the comparison of individuals who have had ulcerations which did not result in general manifestations with the individuals who infected them, or with those whom they have infected, we find without exception that the latter, equally with the former, have had sores, the action of which was limited to the part first inoculated. Thus an ulcer followed by constitutional syphilis never gives rise to a merely local ulcer; and a purely local ulcer cannot produce an ulcer which will be followed by the general manifestations of syphilis. The uniformity of the facts which have come under my observation — none but apparent exceptions having ever been met with—fully justifies me in enunciating the following proposition as a law:—

"*Whenever a person has a chancre and afterwards general syphilis, the generalization of the disease is first of all due to the fact that the person from whom the contagion came had a chancre which was necessarily followed by general symptoms.*

"Of thirty-four cases of syphilitic erythema, in which I have been able to confront the patients with those who infected them, and in some instances with those whom they had afterwards infected, in thirty-one, conformably to the law just enunciated, all the individuals thus confronted presented lesions of the same character; all without exception had ulcers which were followed by general syphilis. In only three, from the absence of symptoms of general infection, did there seem to be any exception, but induration was

found at the site of the sore, showing that the exception was only apparent; moreover, the mercury which had been administered for the latter fully accounted for the absence, or delay in the appearance, of general manifestations."

The immutability of these two varieties of venereal ulcers being thus established by clinical experience, it is evidently necessary to admit that they constitute two species. The question then remains whether or not they bear any relationship to each other. One of two alternatives must be true: the virus of both must be the same, but of greater intensity in one than in the other; or there must be two poisons totally and radically distinct.

Two years after the publication of M. Bassereau's work, the first mentioned supposition was adopted by M. Clerc,[1] another pupil of Ricord, who maintained that the virus of the soft was a modification of that of the hard variety; the former bearing the same relation to the latter that varioloid does to variola, and the false to the true vaccine pustule; and in accordance with this view, the name of "chancroid" was given to the first, while the term chancre was exclusively reserved for the second ulcer. This modification, as M. Clerc believed, was produced by the passage of the virus through the system of a person already under the influence of the syphilitic diathesis; the poison, thus materially changed in its nature, was capable of indefinite transmission by contagion, but could never recover its original power of infecting the constitution; just as the false vaccine pustule may sometimes[2] (not always) be inoculated from one individual to another without affording protection against variola, or, in other words, without exerting any influence upon the general system.

M. Clerc's theory was sufficient to explain all the phenomena hitherto stated in the quotation from M. Bassereau, and it only remained to demonstrate by direct observation whether or not the transmission of the syphilitic virus through a system already infected would produce such modification as was claimed in its nature. At the time M. Clerc's essay appeared, the necessary facts were wanting to determine this point, but they have since been met with and

[1] Mémoire du Chancroïde Syphilitique, Paris, 1854.

[2] The theory of M. Clerc appears to be as defective in its analogies as in the absence of direct proof, for the false vaccine pustule is not always perpetuated as such; and there is abundant evidence—cited very fully by M. Fournier (Leçons sur le Chancre, p. 168)—to show that varioloid may give rise to variola and vice versâ in subjects unprotected by vaccination or previous attacks. The assumed permanence of these forms of disease, when once established, cannot therefore be sustained.

have proved the theory without foundation. In several instances, a man laboring under the symptoms or diathesis of general syphilis has contracted a sore from a woman having a true chancre, and although, under these circumstances, as will be seen hereafter, the ulcer in the male closely resembles a chancroid in appearance, yet if it be communicated to a third person as yet free from constitutional taint, the result will be a chancre and general syphilis. We thus have positive proof that no such modification takes place as asserted by M. Clerc; and his theory is at present generally abandoned, although the term "chancroid" is conveniently retained to distinguish the local ulcer from the true chancre.

Bassereau regarded the first alternative above mentioned, of which Clerc's theory is the only representative, as deserving of rejection from the absence of any proof in its favor; and boldly advocated the second, viz., that the virus of the chancroid is radically distinct from that of a chancre.

As we have already seen, Bassereau found additional evidence of the correctness of this view in a careful study of the older writers on medicine, from which it appears that simple venereal ulcers have been known from the earliest times of which we have any record; that the true chancre and general symptoms were first observed in the latter part of the fifteenth century, during the Italian epidemic; and that for twenty or thirty years afterwards these two species of ulcer were never confounded; the duality of the chancrous virus is not therefore a modern discovery, but was familiar to those who witnessed the first irruption of syphilis into Europe.

Adopting Bassereau's own words: "When we read all that ancient and modern authors have written on the diseases of the organs of generation, we find that gonorrhœa, venereal ulcers, buboes, and vegetations are mentioned as late as the last years of the fifteenth century, as diseases requiring only local treatment; up to this time there is not the slightest allusion to any symptoms consecutive to the diseases of the genital organs. The end of the fifteenth century, according to all contemporary authors, was marked by the appearance of a new disease. This disease commenced by *indurated* ulcers upon the genital organs, which were speedily followed by pustular eruptions over the whole body, and by frightful pains in the head and limbs. The physicians who were eye-witnesses of the new disease did not at first confound the callous ulcers in which it commenced with the ulcers of the genital organs which had been known for ages. Thus these two species of ulcers occupy in their writings separate chapters, and even separate books.

But, twenty or thirty years after the appearance of syphilis in Europe, many physicians not knowing, as those did who witnessed its first ravages, how to distinguish the symptoms by which the new disease commenced from those which had no relation whatever with it, assumed by degrees the habit of submitting to mercurial treatment, without distinction, all persons affected with gonorrhœa, ulcers and buboes; for it had already become a general practice to administer mercury, not only for the purpose of modifying existing syphilitic symptoms, but also as a prophylactic agent against future symptoms, as soon as the first signs of contagion began to appear. The confusion which reigned in practice was soon introduced into the works of the day; the writers on syphilis in the middle of the sixteenth century included, one by one, under the name of syphilis all those venereal symptoms which had been known from the earliest antiquity, and which the physicians who exercised their art in the last years of the fifteenth century had taken care to separate from the symptoms of the new disease."

The attention of the profession being thus directed anew to the important question of the unity or duality of the chancrous virus, other observers immediately set to work to test the accuracy of M. Bassereau's observations, and new facts soon began to appear, all of which were found to point in the same direction. In 1856, M. Dron[1] was able to collect one hundred and eleven instances of confrontation, including those of Bassereau relating to the initial lesion of syphilis, those of M. Clerc relating to the chancroid, and others relating to both varieties furnished by Diday, Rollet, Rodet, and Fournier, and in all, without exception, the type of the ulcer remained unchanged in passing from one individual to another. Farther investigations, under the supervision of Ricord and with the same result, were made by MM. Fournier and Caby, who availed themselves of the unequalled facilities for such examination afforded by the chief venereal hospitals of Paris—one (du Midi) devoted to men, the other (St. Lazare) to women—and of the vigilance of the French police. These observations were published in detail by M. Fournier in his edition of Ricord's *Leçons sur le Chancre*,[2] and also in a pamphlet entitled, *Recherches sur la Contagion du Chancre*,[3] and comprise fifty-nine cases of transmission of chancres, and thirty-nine of chancroids. The value of many of these cases was materially enhanced by the fact that two or more men were contaminated by the same woman, and thus the testimony in favor of the duality of

[1] "Du Double Virus Syphilitique," thèse de Paris, 1856
[2] Paris, 1858. [3] Paris, 1857.

the chancrous virus was multiplied. In one, two friends, who shared the favors of the same woman having a true chancre, caught, each of them, a chancre followed by general symptoms; and the father of one of them, an old man aged seventy-three, had connection with his son's mistress, and met with the same fate. Again, six persons were infected from the same source, and the consequences in all were identical, viz., chancres and general manifestations. So with the chancroid; in several of Fournier's cases, two, three, or four men, bearing chancroids, were found together in the wards of the Hôpital du Midi, all of whom ascribed their contagion to the same woman; who, on examination, was proved to have the same species of sore; and in none did general symptoms appear during several months that they were kept under observation.

Thus far in our account of Fournier's investigations, we find that they merely confirm the observations of Bassereau, since they all relate to the transmission of venereal sores between persons free from previous syphilitic taint. It remains to be proved what effect, if any, is produced in each species by being communicated to a system already under the influence of the syphilitic diathesis. The solution of this question was also undertaken by Fournier, who found, as regards the chancroid, that the sore was in no way modified; that if, for instance, a woman having a chancroid, communicated it to a man whose constitution was already infected with the virus of true syphilis, and he gave the same to a woman free from such taint, the resulting sore would in no respect be changed in consequence of the general infection of the man through whom it had been transmitted. This result might have been predicted beforehand, from a consideration of the distinct nature of the two kinds of virus, neither of which will directly influence the other, any more than syphilis will affect the course of gonorrhœa, or *vice versâ*.

With regard to the true chancre the results were more novel and interesting. A sore of this species, communicated to a subject already infected with syphilis, does not present its usual characteristics; it is either not at all or only imperfectly indurated and is unaccompanied by induration of the neighboring lymphatic ganglia; in short, it so closely resembles a chancroid that it cannot be distinguished from it by any outward sign.[1] If, however, this sore —in appearance a chancroid, but in reality a chancre, modified by the constitutional infection of the person bearing it—be communicated to a third person free from constitutional taint, it will resume

[1] This point will receive further consideration hereafter.

its normal characteristics, will become indurated, be accompanied by induration of the neighboring lymphatic ganglia, and be followed by the general manifestations of syphilis.

The evidence on which the statement just made regarding a chancre is based, is sufficient, though not so great in amount as that relating to the transmission of chancres between individuals free from constitutional infection; since facts capable of solving the question under consideration are necessarily rare. For, in the first place, the syphilitic virus rarely takes effect at all upon a subject already infected; one general attack protecting against even local manifestations of the poison, just as vaccination is without result upon a system once imbued with the vaccine or variolous virus; and, in the second place, supposing contagion to occur, the disease must be again communicated to a person who has always been free from constitutional taint. These numerous and complex requirements, however, have all been present in seven cases, of which Cullerier,[1] Melchior Robert,[2] and Diday,[3] each observed one, and Fournier and Caby four; and they all concur in showing that, contrary to M. Clerc's theory, the syphilitic virus is not modified by being communicated to a system already infected, and although it produces a sore apparently identical with a chancroid, its essential attributes are unchanged.

Another point to which Fournier directed his attention was whether phagedenic ulceration is due to any peculiarity inherent in the virus—a question which the confrontation of patients answers in the negative. The origin of phagedena is probably complex, being attributable in some cases to noxious principles in the primary pus of contagion, more frequently to constitutional cachexia in the recipient, and sometimes to both causes combined; but without entering fully into its etiology, it is sufficient for our present purpose to say that the virus of phagedenic ulcers is not a distinct species, since this form of ulcer may owe its origin either to a chancroid or a true chancre.

The results thus far attained by comparison of the symptoms of those giving and those receiving venereal ulcers may be summed up in the following propositions:—

1. Among persons free from previous syphilitic taint, each of the two species of ulcer is transmitted in its kind: the chancroid as a chancroid limited in its action to the neighborhood of its site; the chancre as a chancre, followed by general manifestations.

[1] Fournier, Contagion du Chancre, p. 57. [2] Dron, Thèse, already referred to.
[3] Annuaire de la Syphilis, année 1858, p. 277

2. A sore with a soft base, and unaccompanied by induration of the neighboring lymphatic ganglia, in a subject already infected with syphilis, will, when communicated to a person free from syphilitic taint, give rise either to a chancroid or to a chancre, according to the nature of the virus which occasioned the first mentioned ulcer.

3. The virus of a chancroid is a poison distinct from that of a chancre.

4. Phagedenic ulceration of a venereal ulcer does not depend upon a specific difference in the virus.

In reviewing the labors, of which a somewhat full account has now been given, we find that the duality of the chancrous virus is established upon the same evidence as naturalists determine the identity of species in the animal and vegetable kingdoms; viz., by the immutability of certain traits in successive generations. The "immutability of species" lies at the foundation of all classification in natural history; it is the groundwork upon which the whole superstructure rests; and although we cannot always expect to follow out the same laws in the arrangement of the Protean forms of disease that we do in nature, the simple principle referred to is unquestionably as applicable to one as to the other; nay, when present in morbid manifestations, it may be regarded as of the greater value from the very fact of their general inconstancy. The characteristics, the immutability of which is relied upon to establish the duality of the chancrous virus, are the limitation of the power of the ulcer to mere local action on the one hand, and, on the other, its necessary influence upon the general system; and no one will fail to see that, if these can be proved to be constant, they are sufficient to establish a distinction of species.

It should be observed that the external appearance of venereal ulcers does not enter as an element into this consideration. The proof would be equally valid, even if it could be shown that the two species are never distinguishable by any outward sign. It is sufficient to establish the fact that the action of the virus in one series of cases is local, and in the other general. Naturalists, in many instances, ground their classification of species upon differences confined to one period of their existence. The young of many forms of animal life closely resemble each other, although the adults are widely different. From the study of embryology alone, Agassiz has derived the most correct system of classification which has ever been advanced. While, therefore, as will hereafter appear, the chancroid and chancre do present, in most cases, differences recog-

nizable by the sight and touch, these must be regarded as additional, but not essential, evidence of the distinct nature of the two diseases; and their absence, as occurs in some instances, and perhaps in all, when the virus of a chancre is implanted upon a system already infected, does not invalidate the above reasoning.

The new doctrine upon this subject, which, as shown by Bassereau, is an old doctrine revived, appears to me to occupy an impregnable position. The confrontations of the observers whose names have been mentioned, alone amount to 137, and among them all, not a single instance of interchange between the two forms of ulcer has been met with. Moreover, as Rollet remarks, this number is but a tithe of the concurrent testimony which we now possess on this point; since, in addition to the confrontations of persons having venereal ulcers reported by the authors now cited, we may rightfully include the hundreds of recorded cases of the communication of syphilis from secondary lesions, either between nurses and infants or between adults; the numerous instances in which the disease has been conveyed by vaccination; those in which the syphilitic virus has been artificially and intentionally inoculated upon persons free from syphilitic taint; and the tens of thousands of inoculations (usually with the virus of the chancroid) employed in the so-called practice of syphilization:—in all of which either syphilis has been the origin of syphilis, or a local contagious ulcer the origin of a local contagious ulcer. Again, upon no other ground than a duality of poisons, can we satisfactorily explain why the same individual should repeatedly contract a local sore and after a short interval incur another contagion resulting in constitutional infection; or why a chancroid and a true chancre should ever coexist upon the same person—instances of which are of almost daily occurrence. Nearly every surgeon has the opportunity to satisfy himself of the truth of this doctrine by personal observation; let him but take note of the not unfrequent cases in which a husband gives a venereal ulcer to a wife whose fidelity cannot be called in question, and he will find that they will both escape, or both incur constitutional infection. Thus, every one can contribute his quota to the statistics on this interesting subject. For myself, in a somewhat extended field of observation during twelve years of practice, I have never seen an instance of interchange of the chancroid and syphilis.

In pursuing these investigations, it is of course necessary to guard against all sources of error; the fact should be well established that the person supposed is really the one who gave the disease; it should be ascertained with certainty that neither the man nor woman has

been previously infected, otherwise he or she is incapable of receiving a second infection; and the influence of a mercurial course in preventing, or more frequently in retarding, general manifestations, should be borne in mind. Nor is mercury the only agent capable of delaying the appearance of secondary symptoms; the same effect may be produced by a course of iodide of potassium, sudorifics, or other medicines which increase the excretions from the body.

It is now evident that the local contagious ulcer of the genitals should no longer be described under the head of syphilis, but should be considered apart like gonorrhœa, as was done by writers upon Venereal during the thirty years immediately succeeding the Italian epidemic.

With regard to the nomenclature of the contagious ulcer of the genitals and the initial lesion of syphilis, both of which until recently were included under the head of "chancres" or "primary syphilis," no little confusion at present exists. Their distinct nature being recognized, it is of course desirable to designate them by distinct names; but, retaining the term *chancre* for one of them, to which shall it be applied, and how shall we call the other? Most French and English writers have seen fit to follow the nomenclature adopted by Clerc, and call the former a "chancroid" and the latter a "chancre;" instead of which Diday calls them "chancrelle" and "chancre," from the analogy of the terms varicella and variola; while the German school of to-day, represented by Hebra, Zeissl,[1] Reder,[2] Lindwurm,[3] and Dr. Elsberg[4] among American authorities, apply the name of chancre exclusively to the local ulcer of the ancients, and designate the sore of 1494 by the term "initial lesion of syphilis," or "primary syphilis."

[1] Allgemeine Wiener Medizinische Zeitung, January 1862. A translation of a portion of this article may be found in the Boston Medical and Surgical Journal, May 15, 1862. Zeissl's clinique is made up of Hebra's venereal patients, and the views of the former surgeon are fully endorsed by the latter.

[2] Ueber die Trennung des Schankers von der Syphilis. Medizinische Jahrbücher, Heft I., 1862.

[3] Ueber die Verschiedenheit der syphilitischen Krankheiten.

[4] Dr. Elsberg claims to have been the first to propose this nomenclature of venereal ulcers. He says in a letter to the author: "I regret my inability to refer you at this time to any printed article in which I have proposed to limit the term chancre to the local venereal sore, and to call the corresponding initial lesion of syphilis at once by the latter name. The simplicity, logical correctness, and incidental advantages of such a nomenclature, first occurred to me during my visit to Europe in 1858, while privately discussing the general subject. I afterwards publicly stated and advocated it in the Med. Soc. at Frankfort on the Main (by whom it may have been published); again in a letter to Prof. v. Bärensprung; before the Medico-Chirurgical College of this city in 1860; and again at great length in a discussion, Feb. 13, 1862."

Now, much may be said in favor of the German plan, which commends itself by its simplicity and its theoretical accuracy. According to it, one man contracts a venereal ulcer, local in its character and incapable of infecting the system, and we say he has a chancre; another man contracts the other venereal sore and we say he has syphilis, thus expressing at once the idea that his system is just as much contaminated and that the same general treatment is required as if secondary manifestations had already made their appearance. To be sure he exhibits as yet only the "initial lesion of syphilis," but the mischief is already done; the sore is not and never has been local; it is not the disease itself, but the manifestation or symptom of a disease—which is syphilis. In like manner, when a person breaks out with a pustule succeeding vaccination, we do not say he has a pustule, but that he has vaccinia; and why, it may well be asked, should not the name of the disease upon which the manifestation depends, be used in the one case as well as in the other?

If, therefore, we could at will arrange our venereal nomenclature *de novo*, and forget the signification which has for centuries been attached to certain terms, I should not hesitate to adopt the plan referred to; but it appears to me that the idea of syphilis in connection with "chancre" is too deeply rooted in the minds of professional readers to render their disseverance practicable without introducing great confusion. Moreover, the German plan has this objection, that it gives one no single word to express "the initial lesion of syphilis," and the inconvenience of resorting to such circumlocution on all occasions will be appreciated, if the reader will notice how often the idea of this sore must be conveyed in the introduction alone of the present work.

I believe, also, that the advantages attached to the German nomenclature can be attained in a simpler way; indeed, that they are already well nigh attained, since it is now very generally understood among those conversant with modern views of venereal diseases, that when a man has a local venereal ulcer he has a "chancroid" and not syphilis, and that when he has a "chancre" his system is already infected with the syphilitic poison, and that his disease *is* syphilis. To consummate the desired end, it is only necessary to abolish *in toto* the illogical terms "soft chancre," "hard chancre," "infecting chancre," etc., and to have it understood that a "chancre" always means the initial lesion of syphilis and nothing else, and that its presence is due to infection of the constitution with the syphilitic virus. The nomenclature adopted in the present edition of this work is in accordance with this view, and I shall designate

the local contagious ulcer of the genitals as the chancroid, reserving the term "chancre" exclusively for the initial lesion of syphilis.

The distinction which is now drawn between the chancroid and chancre explains in a great measure the variance which has long existed with regard to the treatment of venereal sores between the "mercurialists" and "anti-mercurialists." The former, being a strictly local disease, requires no constitutional remedies, unless, in exceptional cases, as adjuvants to local treatment. Mercury is only of value in cases of syphilis, including its initial lesion or chancre. Since the number of cases of chancroid met with in practice greatly exceeds those of chancre, it is evident that the general results of treatment may be made to sustain either the use or disuse of mercury, if exclusively applied to both affections in common.

COMPARISON OF THE THREE POISONS OF GONORRHŒA, THE CHANCROID, AND SYPHILIS.

A comparison of the three poisons of gonorrhœa, the chancroid and syphilis, so far as we are at present able to understand their nature, leads to the following conclusions.

The only property common to them all is their communication, for the most part, by contact of the genital organs.

The poisons of gonorrhœa and of the chancroid are alike in that their action is limited and never extends to the general system; nor does one attack afford the slightest protection against a second. They differ in that the poison of gonorrhœa may arise spontaneously, while that of the chancroid, so far as we know, never thus originates; that gonorrhœa chiefly affects the surface—true ulceration being rarely induced—and, in its complications, most frequently attacks parts connected with the original seat of the disease by a continuous *mucous* surface, as the prostate, bladder, and testicle; while the chancroid, on the contrary, is an ulcer, involving the whole thickness of the integument or mucous membrane, and its complications are seated in the *absorbent* vessels and ganglia. It would also appear that the poisons of these two affections are limited to one common vehicle, viz., pus. Van Roosbroeck, on the authority of Rollet, has proved by experiment that if the discharge of gonorrhœal ophthalmia be deprived of its pus-globules by filtration, the remaining fluid is innocuous; and Rollet states that he has obtained like results with the pus of chancroids. If these experiments can be relied on, they prove that the virus is not diffused throughout the purulent secretion, but is confined to the pus-globules which it contains. This conclusion is sustained by the fact that

neither the poison of gonorrhœa nor that of the chancroid ever reaches the general circulation, and it is well known that pus-globules are not capable of absorption. When the purulent matter of a chancroid enters the absorbent vessels, as occurs in the formation of a virulent bubo, it is arrested by the first chain of lymphatic ganglia, and goes no farther. The paint used in tattooing is sometimes conveyed to a ganglion in a similar manner;[1] but neither in this case nor the former is there complete absorption.[2]

The syphilitic virus is alone capable of infecting the system at large, and of affording protection by its presence against subsequent attacks. Unlike the poisons of gonorrhœa and the chancroid, it is not limited to purulent matter, but exists in the blood, in the fluids of secondary lesions, in the semen, and probably in other secretions. The secretion of one form of chancre (the superficial variety), as shown by microscopical examination, is often entirely destitute of pus-globules;[3] and the presence of the virus in secondary symptoms is proved by their power of contagion, and in the semen by the occurrence of hereditary syphilis in the offspring when the father is alone infected.

There is no opposition whatever between these three poisons; they may all coexist in the same person, who may at the same time have gonorrhœa, a chancroid, and a chancre, or other syphilitic lesion; hence we may explain a case related by Acton in which each of three students contracted one of these diseases from intercourse with the same woman on the same day. Two of these poisons may be present in the same fluid, as when the secretion of a chancroid or chancre mingles with that of gonorrhœa; or as in the "mixed chancre" resulting from inoculation of the same part, either at the same time or successively, by the virus of the chancroid and

[1] Virchow has given a beautiful plate of the deposit of pigment matter in the axillary gland of an arm, the skin of which had been tattooed, and describes the process of absorption as follows: "A certain number of particles find their way into lymphatic vessels, are carried along in spite of their heaviness by the current of lymph, and reach the nearest lymphatic glands, where they are separated by filtration. We never find that any particles are conveyed beyond the lymphatic glands and make their way to more distant points, or that they deposit themselves in any way in the parenchyma of internal organs." (*Cellular Pathology*, English translation, p. 184.)

[2] Rollet, De la Pluralité des Maladies Vénériennes, Gaz. Méd. de Lyon, No. 3, 1860.

[3] Mr. Henry Lee believes that a chancre is always an ulcer affected with specific adhesive inflammation, and, *unless irritated*, destitute of pus-globules. Of 95 cases examined by the microscope at King's College Hospital, in none was the secretion purulent. (*Medico-Chir. Trans.* vol. xlii. p. 450.)

that of syphilis. The secretion of a chancroid or of a syphilitic lesion may also mingle with the other animal poisons, as the vaccine virus, and each will produce its usual effects unmodified by the presence of the other.

DIVISION OF THE PRESENT WORK.

Following the natural order suggested by the above considerations, I propose to divide the present work into three parts: the First treating of Gonorrhœa and its Complications; the Second of the Local Contagious Ulcer of the Genitals, and its Complications; and the Third of Syphilis.

PART I.

GONORRHŒA AND ITS COMPLICATIONS.

CHAPTER I.

URETHRAL GONORRHŒA IN THE MALE.

PRELIMINARY CONSIDERATIONS.—By far the most frequent disease originating in sexual intercourse, is an affection of certain mucous membranes, a prominent symptom of which is an increased secretion and discharge from the diseased surface. At various times and places, this disease has received different names, founded on the prevailing ideas of the nature of the secretion referred to. At an early period in the history of Venereal, the discharge was supposed to consist of the semen, and hence the disease was called gonorrhœa, from γονη, sperm, and ῥεω, to flow; a name which is still in use among American and English writers, notwithstanding the incorrectness of the supposition in which it originated.[1] The French call the same affection "blennorrhagie," or a flow of mucus, a name which is also erroneous, since the discharge does not consist of mucus alone, but of a mixture of mucus and pus. In popular language it is termed "clap"[2] by the English, and "chaude-pisse" by the French.

The chief mucous membranes subject to gonorrhœa are those lining the genital organs in the two sexes, and the conjunctiva oculi. Gonorrhœa of the anus, mouth, nose, and external ear are, indeed, mentioned by authors, but the existence of all of them is more or less doubtful. Perhaps there is the least question in ad-

[1] COCKBURNE (The Symptoms, Nature, Cause, and Cure of Gonorrhœa, London, 1757) first established the fact that gonorrhœa is not a flow of semen.

[2] The term "clap" is said to be derived from the old French word *clapier*, indicating the low places where the disease is contracted.

"Old French *clapises*, public shops kept by prostitutes. *Hoblyn*;—*clapiers*, an old term for houses of ill fame."—*Worcester's Dictionary*.

mitting gonorrhœa of the anus and rectum, though it is said to be rare even in countries where unnatural practices are frequent; but we can hardly admit under this head those cases in which the anus is simply excoriated by a discharge flowing from the urethra or vulva, without extension of the disease to the rectum.

Reported cases of gonorrhœa of the mouth, nose, and external ear are very few in number, and are all of them open to serious question; as, for instance, the supposed case of gonorrhœa of the nose, reported by Mr. Edwards,[1] in which it is very doubtful whether the disease was of this origin and not a simple catarrhal affection. M. Diday relates some experiments which will serve to elucidate this point, though we are surprised, in reading them, that any surgeon should presume to make them, or any patient submit to them. M. Diday says: "Frequently (eight or ten times at least), for the purpose of experiment, I have moistened the end of my finger in the urethral discharge of patients with gonorrhœa, when the disease was in its most acute stage, applied it within their nostrils and rubbed it into the nasal mucous membrane, and there has never resulted the slightest degree of inflammation in the part."[2]

But when we recollect how frequently a disregard of cleanliness must cause the application of gonorrhœal matter to the nostrils and lips, and how readily such applications excite inflammation of the ocular conjunctiva, the great rarity of suspected cases of nasal and buccal gonorrhœa must convince us, without the necessity of such experiments as those above mentioned, that certain mucous membranes are more apt to contract gonorrhœa than others; and in this we may find an analogy to an extraordinary fact which at one time excited much attention, viz., that all parts of the body are not equally susceptible of the two species of venereal ulcers; the chancroid never being met with upon the head or face, although it may be implanted there by artificial inoculation. The reason of the preference of these diseases for certain localities escapes us, but they are not the only instances of the kind met with.

The symptoms and the treatment of gonorrhœa vary according as the disease affects the male or female, and according also to the portion of mucous membrane attacked; it will be convenient, therefore, to consider this affection under corresponding heads.

[1] London Lancet, Am. ed, June, 1857.
[2] Annuaire de la Syphilis, année 1858.

URETHRAL GONORRHŒA IN THE MALE.

Men are more liable to contract gonorrhœa than women; and of a given number of cases of this disease in the former, in a large proportion it is the urethra which is affected. Cases of urethral discharge in the male outnumber all other forms of gonorrhœa in the two sexes combined. The explanation of this fact will appear when we come to consider the causes and nature of gonorrhœa.

SYMPTOMS.—The symptoms of urethral gonorrhœa in the male first appear, as a general rule, between the second and fifth day after exposure; though, in exceptional cases, as late as the seventh, tenth, or fourteenth day; but their occurrence after this time, as alleged by some authors, is, I believe, to be explained on the ground that the earliest manifestations of the disease have been overlooked. At first, the symptoms are very slight, consisting only of an uneasy or ticklish sensation at the mouth of the canal, which, on examination, is found more florid than natural, and moistened with a small quantity of colorless and viscid fluid, which glues the lips of the meatus together. This moisture of the canal gradually increases in amount, until on pressure a drop may be made to appear at the orifice; at the same time it begins to lose its clear watery appearance, and assumes a milky hue. Examined under the microscope, it is found to consist of mucus with the addition of pus-globules; the number of the latter being proportioned to the depth of color of the discharge. Meanwhile, some smarting is felt by the patient in the anterior portion of the canal during the passage of the urine.

Such are the symptoms of the early stage of gonorrhœa. The exciting cause of the disease has been applied to that portion of the canal which lies near the orifice of the meatus and which was chiefly exposed to contagion, and the ensuing inflammation is gradually lighted up in this part, and has not yet extended beyond that portion of the urethra known as the fossa navicularis. This early stage of gonorrhœa is often called "the stage of incubation," a name which is objectionable because the inflammatory process is doubtless set up at the time of the application of the exciting cause. Time is required for it to produce its full effect, and the earliest symptoms are but slowly and gradually ushered in. A more appropriate name is the first or preparatory stage. It is important to recollect the symptoms of this stage and the fact that the disease is as yet confined to the external portion of the urethra, since, as we

shall see hereafter, a more rapid method of cure may now be resorted to than is admissible in the subsequent stages.

The first stage of gonorrhœa usually lasts from two to four days. The symptoms gradually increase in intensity, until, in about a week after exposure, the second or inflammatory stage may be said to commence. If we examine the penis during this stage, we find the mucous membrane covering the glans, reddened and with an angry look. The whole extremity of the organ is swollen, so that the prepuce fits more tightly than natural. In some cases the latter is puffed out by œdema in the cellular tissue, and phymosis may exist, rendering it impossible to uncover the glans. The inflammatory blush is especially marked in the neighborhood of the meatus, the lips of which are swollen so as to contract the calibre of the orifice. The discharge has now become copious, so much so in some instances as to drop from the meatus as the patient stands before you. It is thick, of a yellowish cream color, and not unfrequently tinged with green. This greenish hue, as in the sputa of pneumonia, is due to the admixture of blood-corpuscles, which may be sufficiently numerous to produce the characteristic color of blood. The penis generally, and especially upon the under surface over the course of the canal, is sensitive and tender on pressure.

While passing his urine, the patient complains of intense pain which is now not confined to the auterior part of the canal, but is felt in all that portion of the organ anterior to the scrotum, or is even more deeply seated. The severity of the suffering during the act is in some instances very great. The pain is compared to the sensation of a hot iron introduced within the canal, and the popular name, *chaude-pisse*, given to the disease by the French, is fully justified. This pain is excited in part by the irritation produced upon an abnormally sensitive membrane by the salts contained in the urine, but chiefly, I am inclined to think, by the distention of the contracted and sensitive canal by the passage of the stream. Hence, during the act, the patient involuntarily relaxes the abdominal walls, forces the air from his lungs, and keeps the diaphragm elevated, in order to diminish the pressure upon the bladder and lessen the size and force of the stream of urine. In consequence also of the urethra being contracted and more or less obstructed by the discharge, the stream is forked or otherwise irregular.

Another source of suffering in this stage of gonorrhœa is the nocturnal erections, which are apt to come on after the patient is warm in bed. The genital organs are in a highly sensitive condition, and are readily excited by lascivious dreams, the contact of

the bedclothes, or a distended bladder; or, independently of such exciting cause, they assume a state of erection which even in health is more apt to occur during sleep. When thus excited, it will often be found that the penis is bent in the form of an arc with its concavity downward. This condition is known as chordee. Its explanation is very simple. The urethra, the chief seat of the inflammation, runs along the under surface of the penis. Plastic lymph is effused around the canal, gluing the tissues together and rendering this portion of the penis less extensible than the remaining portion composed of the corpora cavernosa. Hence, in a state of erection, the corpus spongiosum surrounding the urethra, not being able to yield to the distention, acts like the string of a bow, and chordee is produced. The stretching of the parts thus adhering together excites pain, which is often very severe. The sufferer, awaking from sleep, instinctively grasps the penis in his hand, and bends it in a still smaller curve, so as to remove the strain from the under surface and thus ease the pain. I have been in the habit in my lectures of illustrating the mechanism of chordee by gluing a piece of tape along the surface of an india rubber condom, and then distending it with air or water. It not unfrequently happens that during one of these attacks of chordee, the mucous membrane of the urethra becomes lacerated, and hemorrhage takes place from the canal. In this way nature may produce local depletion, and if the flow be not excessive, the effect is often beneficial.

The above explanation of the mechanism of chordee is the one usually received, though it is proper to state that it is rejected by Mr. Milton, who believes that chordee is due to spasm of the muscular fibres, which Kölliker and Mr. Hancock have shown to exist around the whole course of the urethra.[1] Milton's explanation is opposed by the fact that bending the penis so as to increase the curve of the arc affords partial ease to the pain of chordee, and I am not convinced that the generally received opinion should thus be laid aside, though it is highly probable that spasmodic muscular action plays some part in the production of the frequent erections and chordee which take place in gonorrhœa.

During the inflammatory stage of gonorrhœa abscesses sometimes form in the cellular tissue covering the urethra, either anteriorly to the scrotum, or in the perineum; and may attain a very considerable size. If left to themselves, they are liable to break

[1] MILTON on Gonorrhœa, p. 75.

internally within the canal and give rise to urinary abscess and fistula.

It is chiefly during the second stage of gonorrhœa that buboes are met with, if they occur at all; for they are rare compared with the number of patients afflicted with this disease. According to the statistics of the Antiquaille Hospital at Lyons, an attendant bubo is met with in one out of every fourteen cases of gonorrhœa.[1] They are at once recognized by the physician and patient by the enlargement and tenderness of one or more glands in the groin, occasioning considerable pain and uneasiness in walking and standing. Buboes attendant upon gonorrhœa, uncomplicated with chancroid, are sympathetic buboes; of which a fuller description will be given hereafter, when speaking of buboes in general. They may generally be made to disappear in a few days by keeping the patient quiet and producing a little counter-irritation by painting the skin over them daily with tincture of iodine. It is only in scrofulous subjects, or in consequence of violence, excessive fatigue or general depressing influences, that they ever exhibit a tendency to suppurate. I have known of one instance of a man suffering from gonorrhœa, who after exposure to great hardship upon a wreck, had a suppurating bubo that confined him to his bed for six months.

Inflammation of the lymphatic vessels running along the dorsum of the penis is still another complication of the acute stage of gonorrhœa, and one which is also met with in connection with chancroids. It is to be carefully distinguished, as we shall see hereafter, from the induration of these vessels which often attends an indurated chancre. "It occupies the same vessels and the same situation, and presents the same forms as the latter; but is distinguished from it in several ways: 1. By its feel, which is like that of an hypertrophied cord, elastic but not cartilaginous. 2. By the fact that the cellular tissue uniting the vessels generally participates in the inflammation, and thus binds together in a large cord the dorsal vein, the lymphatics and the artery, rendering it difficult to distinguish the inflamed lymphatics from the bloodvessels. 3. By the pain, generally severe, which it excites, and by the swelling and redness visible over the course of the inflamed vessels, caused by the extension of the inflammation to the skin."[2] This inflammation of the lymphatics on the dorsum of the penis sometimes gives rise to chordee, with the concavity of the arc looking upward.

The second stage of gonorrhœa, which we have now described, is

[1] Gaz. des Hôpitaux, No 141, 1861.

[2] Bassereau: Affections de la Peau Symptomatiques de la Syphilis, p. 160.

variable in its duration in different subjects. As a general rule, it lasts from one to three weeks, being influenced by the constitution of the individual, his mode of life and the number of his previous attacks. It is succeeded by the third stage or stage of decline. This final stage of acute gonorrhœa is marked by no peculiar symptoms, and is characterized only by the disappearance of the more acute symptoms and a gradual return to a condition of health. The discharge runs through the same phases, in an inverse order, which it did at the outset of the attack. It gradually becomes less and less purulent, and finally is almost wholly mucous, before completely disappearing.

Perhaps the most valuable indication of the ushering in of this stage of gonorrhœa is the marked diminution or entire cessation of the pain in passing water. The painful erections and chordee may continue after the acute inflammation has subsided, since it takes time for the plastic matter effused around the urethra to be absorbed.

We have reason to believe that in the course of an attack of gonorrhœa, the disease gradually extends from the outer to the deeper portions of the canal, and it is in this latter situation that it is prone to lurk for an indefinite period. After the discharge has lasted for several weeks, we may evacuate the whole of the spongy portion by pressure from behind forward in front of the scrotum. and then, when no further discharge can be made to appear, we can still produce it by the exercise of similar pressure on the perineum. In some instances, the inflammation extends to the mucous membrane of the bladder.

The duration of the final stage of gonorrhœa is, as a general rule, longer than either of the preceding. It may be cut short by treatment, but, if left to itself, commonly lasts for weeks or even months. Gonorrhœa is a disease which, independently of treatment, rarely terminates in less than three months.

Thus far I have said nothing of the reaction of this disease upon the general system. This varies greatly in different individuals and in different attacks in the same person. In some rare cases there is considerable febrile excitement during the inflammatory stage, marked by the usual symptoms of headache, dry skin, full pulse, furred tongue, etc. As a general rule, however, there is but little constitutional disturbance, and after the acute symptoms have passed. the invariable tendency of the disease is to depress the general health. This fact should be remembered in the treatment.

A first attack of gonorrhœa is usually more acute than subsequent

ones; the latter often being subacute or chronic from the first. They are also more difficult to be influenced by remedies, and show a decided tendency to run into gleet.

Cases of gonorrhœa have been reported, in which it has been said there was no discharge whatever—all the other symptoms of gonorrhœa being present, and the disease following impure coitus. These have been called cases of dry gonorrhœa. I doubt whether there be a total absence of all secretion in these cases throughout their whole course, but can readily conceive of an inflammation of the mucous membrane of the urethra, resembling that of erysipelas upon the skin, in which the secretion is for a time but slight, and incapable of detection except by a careful examination of the urine. As the inflammation subsides, however, I should expect to find distinct traces of a discharge. We have analogous symptoms occasionally in inflammations of the pituitary membrane of the nose. Two cases of this variety of gonorrhœa are reported by Dr. Beadle in the *New York Journal of Medicine and Surgery*, for October, 1840.

Causes and Nature of Gonorrhœa.—Every one is aware that urethral gonorrhœa in the male often proceeds from direct contagion, or, in other words, from intercourse with a woman affected with the same disease. But there is another mode of origin, admitted by nearly every writer, as of at least occasional occurrence, but with regard to the frequency of which some difference of opinion has been expressed. I refer to gonorrhœa originating in coitus just before, after, or during the menstrual period, or with a woman suffering from leucorrhœa, and, in a few instances, when nothing whatever abnormal can be discovered in the female genital organs, and the disease in the male can only be attributed to the irritant character of the vaginal or uterine secretions.

I have been convinced, by a somewhat extended observation, that gonorrhœa originating in this mode is of very frequent occurrence. Of one thing I am *absolutely certain*, that gonorrhœa in the male may proceed from intercourse with a woman with whom coitus has for months, or even years, been practised with safety, and this, too, without any change in the condition of her genital organs, perceptible upon the most minute examination with the speculum. I am constantly meeting with cases in which one or more men have cohabited with impunity with a woman both before and after the time when she has occasioned gonorrhœa in another person; or, less frequently, in which the same man, after visiting a woman for a long period with safety, is attacked with gonorrhœa without any disease

appearing in her, and after recovery resumes his intercourse with her and experiences no farther trouble. The frequency of such cases leaves no doubt in my mind, that gonorrhœa is often due to accidental causes, and not to direct contagion.

In many of the instances referred to, the woman is suffering from a frequent combination of symptoms met with in practice, viz., general debility, engorgement of the cervix uteri, and more or less leucorrhœa; but her previous history, and the impunity with which her favors have been bestowed for a long period, preclude the idea that her discharge is the remains of a previous attack of gonorrhœa to which it owes its contagious property. Moreover, such an explanation fails to cover other instances, in which there is no appearance whatever of leucorrhœa, and the genital organs, so far as we can discover, are in a state of perfect health; although intercourse about the time of the menstrual period has given rise to gonorrhœa in the male.

An attempt is sometimes made to evade the issue of this question, by asserting that in the cases referred to, the disease has been contracted from another source than the one alleged, and the proverbial mendacity of venereal patients is appealed to in support of this assumption. Argument is of course useless with any one assuming this ground; but to a candid mind, the opinion of such men as Ricord, Diday, and others, who fully sustain the position above assumed, and who are certainly not ignorant of the sources of error surrounding the etiology of venereal diseases, is sufficient to carry great weight, and lead to an impartial investigation of facts which, I believe, can be followed but by one conclusion. For my own part, I desire to state that while pursuing the investigation which has led me to believe in the frequency of gonorrhœa independent of contagion, I have not entertained a single case in which the moral grounds of certainty have not been irresistible; and that a number of my patients have been medical men, and intimate acquaintances, whose sins against morality were fully known to me, who could therefore have had no motive for concealment, and with whom mistake or deceit has been either in the highest degree improbable, or, in repeated instances, well nigh *impossible*. Moreover, it is a mistake to suppose that in investigations of this nature we are entirely at the mercy of the patient's honor and truthfulness, since to one practising in a large city there are a thousand sources of circumstantial evidence and remarkable coincidences in the testimony of persons wholly unknown to each other, which in many cases preclude all possibility of error.

The greatest obstacle to the admission of gonorrhœa independent of contagion appears to be the rarity of urethritis in married men compared with the frequency of leucorrhœal discharges in their wives. As proved by unquestionable cases occurring in my own practice and in that of my medical friends, husbands do not always escape. That they are not more frequently affected is sufficiently explained by the immunity conferred against all simple irritants by constant and repeated exposure, whereby "acclimation"—to use a term adopted by the French—is acquired. The same fact is observed when neither the church nor the state has sanctioned marital relations; since it is not generally the habitual attendant upon a kept mistress affected with leucorrhœa who suffers, but some fresh comer who shares her favors for the first time.

My friend, Dr. B. Fordyce Barker, whose extensive experience with female diseases is well known, and who has thus had the opportunity of studying this subject from an opposite standpoint to my own, tells me that he has noticed a peculiar form of inflammation of the lining membrane of the uterus, in which the uterine discharge loses its alkaline reaction, becomes decidedly acid and acrid, and irritates and excoriates the mucous membrane of the vagina and the surface of the vulva. He adds, that, in *numerous* instances in married life, he has known this discharge to excite urethritis in the male between parties whose fidelity was unquestionable; and he has related to me a number in detail which I would gladly repeat, if space permitted.

Most cases of gonorrhœa from leucorrhœa or the menstrual fluid present no characteristic symptoms by which they can be distinguished from those originating in contagion. The contrary is frequently asserted, and it is said that the former class may be recognized by the mildness of the symptoms, the short duration of the disease, and the absence of contagious properties. I am familiar with the slight urethral discharge unattended by symptoms of acute inflammation, and disappearing spontaneously in a few days, which sometimes follows intercourse with women affected with leucorrhœa; but such instances are far less frequent than those in which the disease is equally as persistent and as exposed to complications as any case of gonorrhœa from contagion. Some of the most obstinate cases of urethritis I have ever met with have been of leucorrhœal origin, and have terminated in gleet of many months' duration. Diday has even set apart those cases of urethritis which originate in the menstrual fluid as constituting a distinct class, characterized

by their greater persistency and obstinacy under treatment than cases of gonorrhœa from contagion.[1]

Those who maintain the non-contagious character of urethral discharges of leucorrhœal origin have failed to adduce the slightest proof in favor of their assumption, and it may safely be asserted that none of them would venture to make a practical application of their principles. The contagious character of the leucorrhœal secretion is already proved by the existence of the disease in the male; why should not the same property be continued another, still another, and any number of removes from its origin? This supposition is sustained by analogy, since no fact is better established than that catarrhal conjunctivitis may be communicated from one person to another until all the members of a family, school, or asylum have become affected. At our public institutions for diseases of the eye such instances are very common, and the physicians of our children's asylums are well aware of the difficulty of eradicating muco-purulent conjunctivitis which has once sprung up among the inmates. At an orphan asylum, under the charge of my friend, Dr. Leaming, this disease was introduced by a single child, brought from Randall's Island, and spread to twenty-two others before it could be arrested. Again, the leucorrhœa of pregnancy is sufficient to give rise to ophthalmia neonatorum: would any one, presuming upon its leucorrhœal origin, dare to apply a drop from the infant's eyes to his own? Several instances are recorded in which physicians have lost the sight of an eye with which the discharge of ophthalmia neonatorum has inadvertently been brought in contact.

The views which I have here advocated relative to the frequency of gonorrhœa independent of contagion, are by no means novel, and are entertained by many of our most eminent authorities, especially among the French, who possess unequalled advantages for investigating the etiology of venereal diseases. The importance of the subject will fully justify me in making the following quotations from other authors.

Ricord says: "If we investigate with the greatest care the exciting causes of gonorrhœa—and I am now speaking of the most characteristic cases of the disease—we cannot help admitting that a gonorrhœal virus is absent in the majority of cases. Nothing is more common than to find women who have occasioned gonorrhœa unsurpassed in intensity and persistency, and attended by the most

[1] Arch. Gén. de Méd., Oct., 1861.

serious complications, and who are yet only affected with uterine catarrh which is sometimes hardly purulent. In many cases, intercourse during the menstrual period appears to be the only cause of the disease; while, in a large number, we can discover nothing, unless perhaps errors in diet, fatigue, excessive sexual congress, the use of certain drinks, as beer, or of certain articles of food, as asparagus. Hence the frequent belief of patients, which is very often correct, that they have contracted their gonorrhœa from a perfectly sound woman.

"I am most assuredly familiar with all the sources of error in such investigations, and I will presume to say that no one is more guarded than I am against the various forms of deceit which are strown in the path of the observer; yet I confidently maintain the following proposition: *Gonorrhœa often arises from intercourse with women who themselves have not the disease.* Any one who studies gonorrhœa without preconceived notions, is forced to admit that it often originates from the same causes that give rise to inflammation of other mucous membranes."[1]

The "preconceived notions" that Ricord here speaks of, have been the greatest obstacle to the admission of the truth in question. To a surgeon making up his mind beforehand that every patient utters a falsehood who says that he has contracted his gonorrhœa from a woman in whom no evidences of disease can be found, any amount of proof is valueless.

Diday, in speaking of the prophylaxis of venereal diseases, says: "A man should never forget that gonorrhœa may be contracted from any woman; and I say any *woman*, and *not* any *prostitute*, for I do not except from this uncivil remark, any member of the gentler sex. No matter how great her cleanliness, her apparent health, her supposed or real virtue, or even her virginity, or how recently she has been examined, a woman may, from some cause or other, have the whites—often of a very innocent character, as from metritis, chlorosis, dysmenorrhœa, catarrhal inflammation, or as a result of confinement, and also, on the other hand, from a gonorrhœa which she has contracted; and *from the very fact that she has a discharge—no matter what its origin—she is liable to give a discharge to a man.*"[2]

Fournier arrives at the same result from an investigation relative to the classes of women from whom gonorrhœa is derived. It appears from his statistics that gonorrhœa was contracted from intercourse with—

[1] Lettres sur la Syphilis, 2d ed., p. 29.

[2] Nouvelles Doctrines sur la Syphilis, p. 515. The italics are in the original.

	Cases.
Women of the town	12
Clandestine prostitutes	44
Kept women, actresses, etc.	188
Working girls	126
Domestics	41
Married women	26
Total	387

Fournier adds: "This result is easily explained, and might even have been predicted. In fact, gonorrhœa is, I think, much less frequently contracted from contagion than from excessive coitus, repeated or prolonged sexual congress, or peculiar excitement during the act; and in most cases of intercourse with public women, all these causes are absent, and intercourse is generally very short, without much excitement, and not frequently repeated."[1]

Again, Mr. Henry Thompson says: "It is a fact too well established to render it necessary to adduce evidence respecting it here, that urethritis in the male is sometimes caused by contact with the other sex, from discharges which are not venereal in their origin."[2]

Finally, from many other writers whose testimony is equally strong in favor of the leucorrhœal and menstrual origin of gonorrhœa in many cases, I will quote the remarks of Mr. Skey:—

"I cannot entertain a doubt that a very considerable proportion of cases of gonorrhœa are *not* the product of a specific poison. The opinions I entertain on this subject are not the product of mere speculation, and still less of a desire to differ with other and more experienced authorities. They are deduced from, what appeared to my judgment, positive facts, and those by no means few or far between. I may venture to say it is notorious that leucorrhœa will produce gonorrhœal discharge; and if a poison be essential to gonorrhœa, whence comes it? Leucorrhœa is not supposed to contain the elements of gonorrhœal poison. Again, gonorrhœa is by no means an infrequent result from intercourse about the period of menstruation; and it also follows intercourse with women under circumstances of mechanical violence."[3]

The importance of the truth laid before the reader in the above remarks and quotations, whenever a physician in the exercise of his profession incurs the fearful responsibility of passing judgment upon the virtue of a woman, and thus affecting her reputation and

[1] De la Contagion Syphilitique, p. 118.

[2] Stricture of the Urethra, p. 120.

[3] Lectures on the Venereal Disease, London Medical Gazette, vol. xxiii. (1838–9), p. 439.

happiness (and often that of many others with whom she is connected) for life, cannot be overrated. In all such cases, the accused should receive the benefit of any doubt which may exist; and the physician who withholds it from her out of a morbid fear that he may be imposed upon,[1] and thus runs the risk of convicting an innocent person, is unworthy of his calling. His province is to decide from the symptoms taken in connection with the known facts of the case, and unless these are sufficient to establish guilt beyond the shadow of a doubt, humanity demands at least a verdict of "not proven." The following cases will illustrate this point:—

Case 1. A gentleman of the city, six weeks after marriage, applied to his physician to be treated for gonorrhœa, which he solemnly declared he had contracted from his wife, and his known probity was such as to render his statement in the highest degree probable. Under the supposition that his disease could only have arisen from contagion, he had already accused his wife of unchastity, her friends had been informed of the charge, and a separation and action for divorce were imminent. His physician examined the wife, whom he found perfectly healthy, and ascertained, on farther inquiry, that the disease in the husband was due to the continuance of coitus during a menstrual period.

Case 2. The following case is reported in a work entitled "Sur la Non-existence de la Maladie Vénérienne," which was published in Paris in 1826:—

A young man became attached to a young female friend, "à peine sortie de l'enfance," and married her after some years of mutual attachment. Some months after this "hymen fortuné!" the young man was compelled to take a journey to some distance, and, while travelling, he experienced pain in making water, and shortly perceived a discharge from the urethra. On arriving at a town, he consulted an eminent surgeon, who assured him he had a gonorrhœa. "Mais, monsieur, je suis nouvellement marié," and he assured the learned surgeon, that he had never known any woman but his wife from the hour of his birth. "Comment," repond le chirurgien, en souriant, "vous voudrez me cacher la cause de votre mal: de quel pays êtes-vous? Vos jeunes gens rougiroient; je vous certifie, monsieur, que vous avez une belle et bonne chaude-pisse." The youth continued to protest his innocence. Some days after the testicle swelled. The surgeon now assured him that if his wife were virtuous, he must have had "une affaire" with another woman, and that

[1] In a discussion upon the origin of gonorrhœa independent of contagion, which I once held with the writer of a work on venereal, the final argument of my opponent was, "I do not like to feel that I am imposed upon by patients."

the pox remained in his blood from that period. Between the two alternatives of his own or his wife's purity, of course he could not entertain a doubt. He wrote to her an indignant and passionate letter, and then blew out his brains. The unfortunate woman submitted to an examination, which proved her free from disease, never uttered another word—shortly miscarried, and died. So much for the honor of our noble profession![1]

CASE 3. A few years since, in one of the New England States, a clergyman came very near being deposed from the ministry, and convicted of adultery, on the testimony of his physician, that a urethral discharge for which he had treated him could only have arisen from impure intercourse!

Other causes, in addition to those already mentioned, may give rise to urethral gonorrhœa in the male. Thus, unquestionable instances are reported in which a gouty or rheumatic diathesis without exposure in sexual intercourse has occasioned a discharge from the urethra.

Ricord relates a remarkable case of tubercular deposit in different portions of the urethra of a strumous subject with symptomatic urethral discharge;[2] and a scrofulous diathesis is generally a strong predisposing, if not an active cause of inflammation of the urethra as well as other mucous canals.

Mr. Harrison reports the case of a medical practitioner who suffered from a puriform discharge, heat and pain along the course of the urethra, attended with frequent micturition, chordee, and sympathetic fever, after eating largely of asparagus.[3]

Among other causes of urethritis are free indulgence in fermented liquors, terebinthinate medicines, paraplegia inducing changes in the urine, the use of bougies, stricture, masturbation, prolonged excitement of the genitals, cancer of the womb, vegetations within the urethra, ascarides in the rectum, dentition, epidemic influences, etc. The internal use of cantharides is peculiarly liable to excite gonorrhœa, which, in this case, commences in the deeper portion of the canal.

M. Latour, editor of the *Union Médicale*, vouches for the truth of the following story: A physician, thirty years of age, had been continent for more than six weeks, when he passed an entire day in the presence of a woman whose virtue he vainly attempted to overcome, but who resisted all his approaches. From ten o'clock

[1] Quoted by Mr. SKEY. loc. cit.
[2] Bulletin de l'Acad. de Méd., vol. xv., p. 565.
[3] London Lancet, Am. ed., Jan., 1860.

in the morning until seven in the evening, his genital organs were in a constant state of excitement. Three days afterwards he was seized with a very severe attack of gonorrhœa, which lasted for forty days.

A chancre within the urethra is attended with more or less thin and often bloody discharge, which will be more particularly described in a subsequent portion of this work. I will merely remark at present that inoculation of the secretion upon the person affected cannot determine the presence of an ulcer, unless it be a chancroid, since a chancre is not auto-inoculable.

Again, urethral discharges are sometimes due to changes in the mucous membrane lining the canal, induced by infection of the constitution with the syphilitic virus. In several instances I have observed a muco-purulent discharge coinciding with the first outbreak or a relapse of secondary symptoms, and so long after the last sexual act that it could not be attributed to the ordinary causes of gonorrhœa. Bassereau speaks of similar cases.[1] There is no more frequent seat of early general manifestations than the mucous membranes in general; and in the cases referred to changes probably take place in the urethral walls similar to the erythema, mucous patches, and superficial ulcerations which are found within the buccal and nasal cavities. These cases are very rare, and can only be distinguished from ordinary gonorrhœa by the previous history and coexisting symptoms of the patient. For instance, if there has been no exposure for a long period, and especially if secondary symptoms have recently made their appearance upon other mucous membranes, the urethral discharge is probably symptomatic of the constitutional disease. Since the secretions of secondary lesions are now known to be contagious, the discharge in these cases is doubtless so, also; it is not susceptible of inoculation upon the person from whom it is derived nor upon any other affected with syphilis, but, if communicated to a healthy individual under the requisite conditions, will give rise to a chancre.

The inferences from what has now been said of the etiology of gonorrhœa relative to its nature, are so obvious that they require little more than mere mention. If in a large proportion of cases the disease can be traced to no other cause than leucorrhœa, the menstrual fluid, or, in less frequent instances, to excessive coitus, intercourse under circumstances of special excitement, inattention to cleanliness, the abuse of stimulants, etc., and if, when thus ori-

[1] Affections Syphilitiques de la Peau, p. 356.

ginating, it is undistinguishable either by its symptoms, course complications, or termination, from the same affection due to contagion, it is evident that it should be ranked among the ordinary catarrhal inflammations of mucous membranes, or, in other words, that it is a simple urethritis, the connection of which with sexual intercourse is a merely accidental, or at all events, not a necessary circumstance.

But—it may be asserted—the possibility of contagion proves the presence of a poison. Granted: but it does not follow that it is a *specific* poison, or one incapable of being produced by simple inflammation. Such a conclusion would be contrary to the facts adduced in the preceding pages, and, moreover, is not required by the analogy of inflammations of other mucous membranes; since, in muco-purulent conjunctivitis—*the true analogue of gonorrhœa*—we have precisely the same order of events, viz., inflammation originating in simple causes, and giving rise to a secretion which is contagious and capable of transmission through an indefinite series of individuals. The discharge from the two mucous surfaces just mentioned would even appear to be transferable, since that from the urethra applied to the eye gives rise to purulent ophthalmia, the secretion of which, if we may rely upon a few experiments by Thiry, of Brussels, will, when brought in contact with the lining membrane of the urethra, produce urethritis.

I have no space to discuss the untenable theory of a "granular virus" of gonorrhœa advanced by M. Thiry, according to which, the presence of granulations upon the mucous membrane is necessary to render the discharge contagious.[1]

TREATMENT.—The treatment of gonorrhœa must be adapted to the general condition of the patient, and especially to the stage of his disease. In the great majority of cases met with in practice, acute inflammatory symptoms have already set in at the time the patient first applies to the surgeon; but in those exceptional cases which are seen at an early period, and *in those only*, we may often succeed in cutting short the disease by means of the treatment termed abortive.

Abortive Treatment of the First Stage.—During the first few days after exposure, varying in number from one to five in different cases, before the symptoms have become acute, when the discharge is but slight and chiefly mucous, and while as yet there is no severe

[1] M. THIRY's views have been published in a series of lectures in the Presse Méd. Belge, and are also advocated by Guyomar, Thèse de Paris, 1858 (No. 282).

scalding in passing water, we may resort to caustic injections with a view of exciting artificial inflammation which will tend to subside in a few days, and supplanting the existing morbid action which is liable to continue for an indefinite period and is exposed to various complications. This is known as the "substitutive," or more commonly as the "abortive treatment" of gonorrhœa. This method has been inordinately praised and as violently attacked; its true merit is probably to be found between these two extremes. It is certainly liable to be greatly abused, and, if so, is both unsuccessful and capable of producing the most unpleasant consequences; but when limited to the early stage of gonorrhœa and used with proper caution, it is a highly valuable method of treatment, unattended with danger, and undeserving the censure sometimes cast upon it.

In employing the abortive treatment, there are several points which it is important to recollect: 1. The disease, in the stage to which this treatment is applicable, is limited to the anterior portion of the urethra, known as the fossa navicularis, or extends but a short distance beyond it; it is not necessary, therefore, that the injection should reach the deeper portions of the canal. 2. For the treatment to be successful, the whole diseased surface should receive a thorough application of the injection, for if any portion remain untouched, it will secrete matter that will again light up the disease. 3. When once a sufficient degree of artificial inflammation is excited, the caustic has accomplished all that can be expected of it, and should be suspended.

Since a solution of nitrate of silver, which is commonly used in the abortive treatment, is readily decomposed by contact with metallic substances, metal syringes should be avoided. Glass syringes, if well made, answer every purpose; but as found in the shops, they are apt to be unequal in calibre in different parts of the cylinder, the wadding of the piston contracts in drying, and a portion of the fluid fails to be thrown out, as is seen by its overflow when the syringe is filled a second time. For these reasons, I never advise a patient to purchase a glass syringe, knowing that it will probably give him much annoyance, and perhaps prevent his deriving benefit from treatment. Fortunately, we have a very excellent substitute in the hard-rubber syringes which can be obtained at the druggists'.[1]

[1] An excellent series of urethral syringes is manufactured by the American Hard Rubber Company. In these instruments, the diameter of the cylinder is in all parts the same; the piston works with great accuracy; the material is not acted upon by ordinary medicinal agents, and the different sizes and forms of the instrument are

The solution of nitrate of silver, in the abortive treatment of gonorrhœa, may be of considerable strength, when only one injection will be required; or, it may be weak, and in that case should be repeated at short intervals until the effect produced be deemed sufficient. I much prefer the latter course, especially with patients who apply to me for the first time, since it enables me to graduate the effect according to the susceptibility of the urethra, which varies in different persons. The following is the formula for the weak form of injection:—

℞. Argenti nitratis crystalli gr. j–iss.
Aquæ destillatæ ℥vj.
M.

With this, as with all injections in gonorrhœa, it is essential to success that the surgeon should administer the injections to his patients, or see, by actual observation, that they know how to use them. Verbal directions cannot be relied upon.

The patient should be made to pass his water immediately before injecting, or, better still, a quarter of an hour before. We wish to clear the urethra of matter, and to have the bladder empty so that the injection may have some time to act before it is washed away by another passage of the urine, and yet a short interval between the last act of micturition and the injection is advisable, in order that as much of the urine as possible may have drained from the canal and little be left to decompose the nitrate of silver. The prepuce should now be fully retracted, and the glans penis exposed. The latter should be wiped dry, so as to afford a firm hold to the thumb and forefinger of the left hand, applied to its opposite sides, and firmly compressing it around the point of the syringe, introduced to its full extent within the meatus. If this pressure be properly made, not a drop of the solution will be lost, as the piston of the syringe is slowly forced down by the forefinger of the right hand holding the instrument, and the whole contents will be dis-

adapted to the various purposes for which it is required. The size most generally applicable to the treatment of gonorrhœa is called "No. 1, B." It holds half an ounce, which is not too much for injections in the latter stages of the disease; if used in the abortive treatment of the first stage, it should be only half filled. "No. 1" holds two drachms, and is well adapted for the abortive treatment. "No. 1, A" is of the same size as the last mentioned, but has a very short nozzle, which is intended to obviate irritating the canal with the point of the instrument. The "Urethral Syringe with extra long pipe," is, in fact, a syringe united to a catheter, and is adapted for injections of the deeper portions of the canal or the bladder. The catheter portion may be bent to any curve desired, by first oiling it and heating it over a spirit lamp.

charged into the canal. The syringe should now be withdrawn, and the fluid still retained for a few seconds by continuing the compression of the glans. When the injection is allowed to escape, it will be found to be of a milky-white color. This is due to the partial decomposition of the contained salt by the remains of the urine and the muco-pus in the canal. As this decomposition has prevented the application of the injection in its full strength to the urethral walls, a second syringeful should be thrown in, and retained for two or three minutes. During this time a finger of the disengaged hand should be run along the under surface of the penis *from behind forwards*, so as to distend the portion of the canal occupied by the injection, and insure the thorough application of the fluid to the whole mucous surface.

This description of the method of using the syringe is, in the main, applicable to all the injections which may be required in the course of a gonorrhœa; but we are now speaking of the abortive treatment, by means of weak injections of nitrate of silver. We will suppose that this first injection has been administered by the surgeon, who, at the same time, has explained the various steps of the operation to the patient. The directions with regard to diet, etc., that will presently be mentioned in speaking of the second stage, should now be given; the patient should be ordered to repeat the injection every three hours, and, for the present, it is best that he should be seen by the surgeon twice a day. It is also well at this time to prescribe an active purge.

This first effect of the caustic injections is manifested in a few hours; the discharge becomes copious and purulent, and considerable scalding is felt in passing water. In the course of twenty-four to forty-eight hours, however, the discharge grows thin and watery, and, very likely, is tinged with blood. It is now time to stop the injection and omit all medication for a few days, until we see how much good has been accomplished. If the treatment meets with its usual success the discharge will gradually diminish, and finally disappear in from three to five days. Sometimes, however, after growing less, it again increases, showing a tendency to relapse. In that case, I usually advise weak injections of acetate of zinc, as recommended in the third stage of the disease. Some surgeons prefer to resume the caustic injections in the same manner as at first, if, after a week has elapsed, any traces of the discharge remain.

The chief objection to this modification of the abortive treatment is, that it is necessary to leave the administration of most of the injections to the patient, who may be prevented by ignorance, or

the requirements of his occupation, from using them as thoroughly or as often as is necessary. If we have reason to fear this, we may resort to a stronger solution, and inject it once for all, with our own hands, but I have found the effect decidedly less satisfactory. It was this method of employing the abortive treatment that was recommended by Debeney of France, and Carmichael of England, by whom this treatment was first introduced to the profession. The same method is also still employed and highly recommended by many surgeons, and especially by M. Diday of Lyon. The strong injection should not contain less than ten grains of the nitrate of silver to the ounce of distilled water, and more than fifteen grains are objectionable, unless with patients who have been under treatment before, and in whom the urethra has been found to be quite insensible.

℞. Argenti nitratis crystalli gr. x–xv.
Aquæ destillatæ ℥j.
M.

The mode of using this injection is identical with that already described. Two small syringefuls should be thrown in; the first to clear the urethra of urine and muco-pus, the second to exercise a curative effect; and the surgeon should feel that the success of the treatment depends, in a great measure, on the thoroughness of its application. As an additional precaution against the fluid extending further back than is necessary, the patient may compress the penis anteriorly to the scrotum, while the surgeon is administering the injection; or the same result may be accomplished by making him sit astride the arm of a chair, and thus compressing the urethra in the perineum.

There is still another mode of employing a strong solution of nitrate of silver, by means of an instrument introduced by Dr. F. Campbell Stewart, of this city, and called by his name. This instrument consists of a straight canula inclosing a sponge, which can be made to protrude from its extremity. This sponge is first soaked in a solution of nitrate of silver, and concealed within the canula. The instrument is then introduced for about two inches within the urethra, when the canula is to be partially withdrawn; the sponge is thus exposed to the contact of the urethral walls, in which position it is to be allowed to remain for a minute or two, and then withdrawn by slowly twisting it on its long axis. By the use of Dr. Stewart's instrument, the extent of the application can be limited at will, and it is perhaps owing to this fact that we can employ with safety a much stronger solution than when using a

syringe. I have thus applied a solution of twenty, and even thirty grains to the ounce, without exciting an undue amount of inflammation, or other unpleasant symptoms. Care should be taken that the instrument be of sufficient size. Some of those found in the shops are too small, not exceeding a No. 7 bougie in diameter. I have had one manufactured for my own use of the size of No. 10.

I cannot leave this subject of the abortive treatment of gonorrhœa, without again expressly stating that I recommend it only in the first stage of the disease, and not after acute inflammatory symptoms have set in, or the patient suffers from scalding in passing water. Taking the usual run of cases as met with in practice, probably not more than one out of ten is seen at a sufficiently early period to admit of the abortive treatment. Its employment in the acute stage, as recommended by its inventors, is generally unsuccessful, and dangerous and even fatal results have been known to ensue. Prudent practitioners have limited the use of caustic injections to the early stage of gonorrhœa, except in some instances in the decline of the disease; but, in the latter case, the mode of injecting must be modified, so that the fluid may reach the deeper portions of the canal.

Treatment of the Acute Stage.—The proper regulation of the diet, exercise, and mode of life of the patient, is of the first importance in every stage of gonorrhœa. In the treatment of the inflammatory stage, as well as in the abortive treatment of the first stage, if the patient can keep his bed for a few days, the battle is half won. The advantages of absolute repose and quiet should be placed prominently before him, and every inducement be offered to lead him to avail himself of them. Yet in practice, we find that very few will submit to this constraint. It is very well to say that every patient that puts himself under the care of a physician, should follow his advice implicitly in all things; but we must take the world as we find it, and the calls of business, or the necessity of secrecy, often render the insistence upon such stringent rules impossible. When life is in danger, men absorbed in business will stay at home, but not merely for an attack of gonorrhœa. This, indeed, should not prevent our doing our best to persuade them, but we shall succeed in but a small minority of cases.

Exercise of all kinds should be avoided as much as possible, walking, dancing, riding on horseback, and standing—in the street, at the desk, at a party—are all injurious. Riding is certainly less objectionable than walking, and yet a long ride, even in a rail-car, often aggravates a gonorrhœa or induces a relapse when it is appa-

rently cured. At home, and at the store or office, the recumbent posture should be maintained as much as possible. It is highly important, also, that the genital organs should be well supported by a suspensory bandage. The kind of bandage is immaterial, provided it fit well and do not chafe the parts; and of these conditions the surgeon should satisfy himself by actual observation. While the more acute symptoms continue, the diet should be exclusively farinaceous; and meat, stimulants, asparagus, cheese, coffee, and acids be forbidden. The perusal of all books calculated to excite the passions, and the company of lewd women, even if no improprieties be committed, should be strictly interdicted. The last-mentioned caution is not generally given without good reason.

At the commencement of the treatment of a case of gonorrhœa in the acute stage, it is well to administer an active purge, as five grains of calomel combined with ten of jalap, a full dose of Epsom salts, or three or four compound cathartic pills of the U. S. P. If the inflammatory symptoms be severe, marked benefit will be derived from the application to the perineum of half a dozen leeches, which, however, are rarely absolutely necessary. Care should be taken to keep the head of the penis free from any collection of matter, lest balanitis be excited or the disease aggravated by its presence. A pair of triangular-shaped drawers, like ordinary swimming drawers, worn next the skin, affords the best protection to the patient's linen. Water, as hot as can be borne, is the most grateful local application that can be used. I have found that it generally affords great relief to the scalding in micturition and the local pain and uneasiness, and can fully indorse Mr. Milton's statement with regard to it. "The only direct application which I can safely say has never disappointed me, which is at once safe, simple, and useful, is that of very hot water to the penis. But to obtain the really good effects it offers, the water must be hot, not lukewarm. In fact, we seldom see so much good ensue as when it is carried to the extent of producing some excoriation and faintness; thus applied, and especially in the early stages of the disease, the weight felt about the testicles soon disappears, the pain on making water and using injections is soothed, and the prepuce and glans rapidly regain a more normal temperature and color."[1] The best method of employing it is to direct the patient to immerse his penis in a cup of hot water for a few minutes before and after using the injection.

After the operation of the cathartic, we may, in most cases, com-

[1] MILTON on Gonorrhœa, p. 21.

mence at once with copaiba or cubebs, rules for the exhibition of which will presently be given at length. If, however, the penis be still much swollen, and the scalding on passing water severe, we may defer the exhibition of the anti-blennorrhagics for a few days, and administer alkalies or diuretics, either alone or combined with sedatives, for the purpose of rendering the urine less irritating by diminishing its acidity, or diluting its contained salts by increasing its quantity. Again, both these classes of remedies may be given at the same time. From one to two drachms of the chlorate, acetate, or nitrate of potash, or two or three drachms of liquor potassæ, may be added to a pint of flaxseed tea; and the patient be directed to take this quantity in the course of twenty-four hours. The following is also an excellent formula:—

℞. Potassæ bicarbonatis ʒij.
Tincturæ hyoscyami ℥j.
Mucilaginis ℥v.
M.

A tablespoonful every three hours.

Do not mix tincture of hyoscyamus and liquor potassæ in the same prescription, since the effect of the former is destroyed by the presence of a caustic alkali.[1] In this stage of the disease, Mr. Milton highly recommends the following:—

℞. Pulv. potassæ chloratis ʒij.
Aquæ bullientis ℥v.
Misce et adde—
Liquoris potassæ ʒiij.
Potassæ acetatis ʒiij ad ʒv.
Misce et cola.

One ounce three times a day.

If the bowels be not freely open, Mr. Milton adds powdered rhubarb to each dose of this mixture, in sufficient quantity (gr. v ad ℈j) to produce two or three loose stools daily. The following is another formula recommended by Mr. Milton:—

℞. Potassæ acetatis ℥j.
Spirit ætheris nitrici ʒiij.
Aquæ camphoræ ℥vj.
M.

One ounce three times a day.

[1] See Paris's Pharmacologia, Ninth Edition, p. 512. This fact has recently been brought forward as new, and confirmed by actual experiment, by Dr. Garrod; Medico-Chirurgical Transactions, Second Series, vol. xxiii. London, 1858.

An elegant and convenient method of administering an alkali is by means of Brockedon's wafers of bicarbonate of potassa, of which two may be given after each meal. The only objection to them is their expensiveness.

If the penis be much swollen and florid, the meatus contracted by the distention of its walls, and the urethra in a state of great sensibility, the above general measures should constitute the only treatment, and no local remedies, with the exception of hot water, be resorted to, until the inflammation has somewhat subsided. In the majority of cases, however, especially when the patient has had gonorrhœa before, the local symptoms are not severe, even in the acute stage, and the point of a syringe can be gently introduced within the canal without exciting much pain. When this is the case, an injection containing glycerin and strongly opiated, will be found to afford great relief to the local pain and uneasiness, and hasten the subsidence of the inflammatory symptoms, and the diminution of the discharge. I can speak very decidedly in favor of this application and of its perfect safety; but the opium must not be added in the form of tincture, or the alcohol, which is an irritant, will counteract its effect; and the fluid is to be injected with gentleness, and not with such force as to painfully distend the canal. The following is the formula that I use:—

℞. Extractii opii ℈j.
Glycerin ℥j.
Aquæ ℥iij.
M.

Injection to be used after every passage of urine.

In many cases of a subacute form, half a grain or a grain of acetate or sulphate of zinc may be added to each ounce of the mixture, even at the outset, and there are but few cases in which it is not admissible in the course of twenty-four or forty-eight hours, when the inflammation, local pain, and scalding are generally found to be much improved. If the case continue to progress favorably, the quantity of the astringent may be gradually increased, and that of the opiate diminished; and the treatment should be continued according to the rules laid down for the third stage, to be mentioned presently.

While pursuing the treatment of the acute stage of gonorrhœa, care should be taken that antiphlogistic measures be not too long persevered with. It should be remembered that the natural tendency of the disease is to lower the tone of the system, and a condition of debility in turn reacts on the disease and prolongs its

duration. We often meet with patients who have treated themselves with low diet and daily purging for weeks, and yet who are no better of their gonorrhœa. An antiphlogistic course alone may relieve the more acute symptoms, but it will not cure the complaint; and so soon as the pain in passing water has diminished and the local inflammation in a measure subsided, the patient should no longer be confined to his room, and should have a more liberal diet; nor, under any circumstances, should his confinement and abstinence be prolonged, if, after a reasonable time, they are found to produce no change for the better, or the pulse becomes feeble, the skin clammy, and the strength exhausted. Indeed, in some cases, in which the constitution is enfeebled by disease, debauch, or previous attacks of venereal, it is necessary to abstain from all measures calculated to lower the tone of the system, and resort to good living and even quinine, iron, and other tonics, from the very outset of the disease. It is, therefore, to be expressly understood that the antiphlogistic treatment here recommended, is intended to apply, in its full force, chiefly to the disease as it appears in first attacks in men of full habit. Those patients who have had numerous previous attacks will rarely require such active treatment in any stage of the disease. The judgment of the surgeon must determine the indications of each individual case.

Treatment of the Stage of Decline.—A marked diminution of the scalding in making water, and of the painful sensations in the penis, is, I believe, a better index of the subsidence of the inflammatory action, than the character of the discharge, which, independently of treatment, often continues copious and purulent after the third stage has fairly commenced.

In giving directions as to the regimen of a patient in the third stage of gonorrhœa, some regard should be paid to his usual mode of life. As a general rule, all indulgence in spirituous or malt liquors should be strictly forbidden, and total abstinence be practised until the cure is complete, and for at least a fortnight afterward. You will meet with some patients, however, who have been free drinkers for years, and who will not well bear the total loss of their stimulus, without becoming so debilitated that their gonorrhœa is thereby prolonged and more difficult to cure. In these *exceptional* cases, it is better to allow a glass of claret, sherry, or even brandy and water, to be taken with the dinner. In any case, malt liquors should be avoided, since they are decidedly more injurious than other liquors which contain a larger amount of alcohol. The patient may now return to a more generous but simple diet, though

salt meats, highly seasoned food, asparagus and cheese should still be avoided. The bowels are not to be allowed to become constipated, and this should be prevented so far as possible by regulating the diet. One or two free stools a day are desirable. If the patient have been confined to the house during the acute stage, he may now be allowed to go out, but should be cautioned against walking or standing more than is necessary, and the genital organs should be well supported by a suspensory bandage. Patients often inquire whether the use of tobacco is injurious; I believe that it is, and that either smoking or chewing, especially in excess, relaxes the genital organs and tends to keep up a urethral discharge. I have frequently been told by patients subject to spermatorrhœa, that smoking during the evening would invariably be followed by an emission during the night, and I am satisfied that many cases of gonorrhœa are prolonged by the excessive use of tobacco. I therefore recommend entire abstinence, or, at least, great moderation, both in smoking and chewing, to persons suffering with this disease.[1]

The chief remedies adapted to the third stage of gonorrhœa are injections, and copaiba and cubebs. By far the more important of these are injections, which constitute our chief reliance in the treatment of this affection, when it has arrived at this stage; and, in spite of all that has been written and said against them, I do not hesitate to say, that the surgeon who voluntarily renounces injections, deprives himself of his best weapon in contending with gonorrhœa, and is comparatively impotent in his attempts to conquer it.

The objections that have been raised against this mode of treatment need not long detain us. They are chiefly the following: 1. It is asserted that the injected fluid carries before it the muco-pus within the urethra, and thus extends the disease to the deeper portions of the canal. Supposing this possible in any case, it cannot take place, if the patient pass his water before injecting, as he should always be directed to do. 2. It is said that injections may excite swelled testicle and other complications of gonorrhœa. This is only possible, when they are used of too great strength or with undue violence. 3. It is supposed by some persons that there is danger of the injection penetrating the bladder; but this idea is entirely groundless. It is absolutely impossible to inject the bladder, however great the amount of force employed, by means of a syringe merely introduced within the meatus. A knowledge of the anat-

[1] Dr. SHIPLEY has recently published two cases of gonorrhœa in which the discharge repeatedly disappeared on leaving off smoking, and returned on resuming it. (*Boston Med. and Surg. Journal*, Nov. 22, 1860.)

omy of the canal is sufficient to establish this point and experience confirms it. Moreover, no harm would ensue even if a portion of the fluid should enter this viscus, for it would be immediately neutralized by the urine. 4. The chief objection that has been alleged against injections is, that they are a frequent cause of stricture of the urethra. This the opponents of injections have endeavored to prove, by showing that most persons with stricture preceded by gonorrhœa, were treated for the latter disease by injections. This is clearly a mode of reasoning, *post hoc ergo propter hoc*, and by no means proves the ground assumed. I have heard of some one, who, to show its fallacy, instituted some inquiries among patients with stricture, as to whether they had taken flaxseed tea for their previous gonorrhœa, and who was able to prove, if such reasoning be reliable, that flaxseed tea is a very fruitful source of stricture. As Ricord justly states, it is much more probable that strictures are due to the chronic inflammation, which, in cases of gonorrhœal origin, has usually preceded them for a long period, than to any influence exercised by injections. This well known effect of chronic inflammation of a mucous membrane in producing an effusion of plastic material in the sub-mucous cellular tissue which by its contraction diminishes the calibre of the canal, is a strong argument in favor of this view. The objections to the use of injections are, I believe, founded on their abuse, or on false reasoning, and will not stand the test of examination. When properly used, they constitute the most valuable means within our reach for the cure of gonorrhœa, and are employed in the practice of all surgeons, with very few exceptions, who have had the opportunity of testing their value.

Injections are particularly adapted to the treatment of the first stage by the abortive method and to the treatment of the third stage of gonorrhœa; although, as already stated, in very many cases they may be used with safety and benefit in a weak form, even in the second or acute stage.

These remarks in favor of injections do not of course imply that they are infallibly successful, nor that they can be used indiscriminately in all cases. Under certain circumstances, their effect is found to be injurious. If in the course of treatment the patient complain of a frequent desire to pass his urine, and other symptoms indicating irritation or inflammation of the neck of the bladder or prostate, injections should be at once suspended. Continuous pain in the penis, or any considerable amount of tumefaction of its tissues also contra-indicates the use of irritant or astringent injections, although the formula containing glycerin and extract of opium,

which was recommended in the acute stage, may still, in many cases, be employed with advantage. Moreover, it should not be forgotten that injections will sometimes keep up a discharge through the irritation which they excite, however simple may be their composition. After the force of the disease has been subdued, they should therefore be used at gradually increasing intervals, or, from time to time, be altogether omitted, until the necessity of their continuance again becomes apparent.

The manner of using the syringe in the third stage is essentially the same as in the abortive treatment of the first stage. A larger syringe, however, should be employed, one, for instance, holding three or four drachms; since there is now no necessity of limiting the action of the injection posteriorly, and, on the contrary, it is desirable to extend it as far back as possible, in order that it may reach the whole diseased surface. For this purpose the finger may be run along the under surface of the urethra from before backwards, as well as in the opposite direction (from behind forwards), as previously recommended, in order to insure complete distention of the canal and exposure of its lucunæ. The patient should always pass his water before injecting, and throw in two syringefuls at each application.

A great variety of substances have been recommended as the active principles of injections. A choice, to a certain extent, is doubtless desirable, since the same injection does not always succeed equally well in all cases. For instance, one of my patients, whom I have repeatedly treated for gonorrhœa, is always made worse by an injection of sulphate of zinc, and is benefited by a weak solution of nitrate of silver. Peculiarities of this kind are occasionally met with, but I believe that much time is wasted by young practitioners in changing from one to another of the many varieties of injections proposed in books, under the supposition that some specific effect is to be obtained from the contained ingredients, whereas, in most cases, success depends upon the thoroughness of the application, and attention to the general health and any existing complications.

My own preferences for an astringent in the active principle of injections in the third stage of gonorrhœa, are very strongly in favor of the sulphate of zinc; which is also the favorite injection of Sigmund of Vienna, Mr. Milton, and many other eminent surgeons. I have already spoken of the addition of a small quantity of this salt to the sedative injections of the acute stage, after the more inflammatory symptoms have been subdued. The proportion of the sul-

phate may be increased and that of the opiate diminished, as the case progresses, and the latter finally omitted altogether. The strength of the injection should be such that it may excite a slight uneasy sensation in the urethra for about ten minutes, but it must not be strong enough to cause severe or long-continued pain. As the case approaches a cure, the injection will cease to excite any unpleasant feeling whatever, and its strength need not be further increased. In most cases, we need not at any period exceed the proportion of the sulphate in the following formula:—

℞. Zinci sulphatis gr. xij.
Aquæ ℥iv.
M.

Glycerin may be substituted for half an ounce or an ounce of the water. As to the frequency with which the injection is to be used, I usually direct the patient to inject after each passage of his urine, with the expectation that he will take four or five injections in the course of the twenty-four hours. It is better that the last injection should be applied an hour or two before retiring, since if used directly before going to bed, it favors the occurrence of erections and chordee during the night.

If the discharge do not materially diminish under the use of these injections, either alone or combined with the internal administration of copaiba or cubebs, I usually resort to a solution of nitrate of silver, of the strength of from two to five grains to the ounce of water, and inject it myself for the patient, daily, or every two or three days, while at the same time he is directed to continue his injection of sulphate of zinc. The effect of an irritant like nitrate of silver should be closely watched, and its administration should not, therefore, be left to the patient himself.

The acetate of zinc is nearly, if not quite as valuable a remedy as the sulphate, and the remarks above made in favor of the latter are equally applicable to the former. Indeed, if I were asked to name the simplest treatment of gonorrhœa, and the one best adapted to the largest number of cases, I should reply: a weak injection of the sulphate or acetate of zinc, containing from one to three grains to the ounce of water. Many men about town constantly carry in their pockets a prescription of this kind (generally with the addition of a little morphine or a few grains of powdered opium), with which they almost invariably succeed in arresting their frequent attacks of gonorrhœa, without resorting to the nauseous anti-blennorrhagics, or finding it necessary to consult a surgeon. A great reputation has been acquired for a reddish powder sold by an irregular practitioner

of this city, who tells his patients that the ingredients are entirely unknown to the profession. This powder, subjected to chemical analysis, is found to contain as coloring matter Armenian bole, and as an active ingredient acetate of zinc.

The sulphate of zinc was a favorite with Dr. Graves, who was in the habit of combining it with the impure carbonate of zinc, as in the following formula:—

℞. Zinci sulphatis gr. iij.
Calaminæ gr. x.
Mucilaginis ʒij.
Aquæ ℥vj.
M.

With regard to the addition of calamine, Dr. Graves says: "How the lapis calaminaris acts, unless on a mechanical principle, it is difficult to explain; but of its utility I am certain, having long used this combination, as recommended in Thomas's Practice of Physic."[1]

The chloride of zinc is a powerful caustic and irritant which fulfils, although in a much less perfect manner, the same indications as nitrate of silver, and may, therefore, be used under similar circumstances. It is a favorite injection with some practitioners, and especially with my venerable friend, Dr. J. P. Batchelder, who employs a very strong solution in all stages of gonorrhœa, and states that but few cases resist more than a week. Dr. B. dissolves ʒij of the chloride in ʒiij of water, and directs the patient to commence with three drops of the mixture to a tablespoonful of water, and inject three times a day; to add a drop at a time (rarely exceeding eight drops) until a smarting sensation is produced; and then gradually to diminish the strength until the discharge disappears.

Of the numerous other formulæ for injections sometimes employed in the treatment of gonorrhœa, the following are among the best:—

℞. Cupri sulphatis gr. xij.
Aquæ ℥iv–vj.
M.

℞. Liq. plumbi subacetatis ℥ss–j.
Aquæ ℥iv–vj.
M.

℞. Aluminis gr. xij–xxx.
Aquæ ℥iv.
M.

Mr. Milton says of alum: "The absence of pain which follows its use, and its feeble curative power, have led me to assign to it only a

[1] Clinical Lectures, London Med. Gaz., new series, vol. i., 1838–9, p. 438.

secondary rank. I am, indeed, extremely doubtful, if it possess any superiority over very mild injections of nitrate of silver or sulphate of zinc, and would, therefore, confine its exhibition to those cases accompanied by severe pain, where it may, during a day or two, serve as a pioneer to the others."

In the following we have a combination of alum and sulphate of zinc:—

℞. Liq. aluminis comp. ℥j.
Aquæ ℥iij.
M.

The two following are excellent formulæ much employed by Ricord:—

℞. Zinci sulphatis,
Plumbi acetatis, āā gr. xxx.
Aquæ rosæ ℥vj.
M.

℞. Zinci sulphatis gr. xv.
Plumbi acetatis gr. xxx.
Tincturæ catechu,
Vini opii, āā ʒj.
Aquæ rosæ ℥vj.
M.

Vegetable astringents may also be employed either alone or in combination with the salts of the metals.

℞. Vini rubri ℥vj.
Acidi tannici gr. xviij.
M.

℞. Zinci sulphatis,
Acidi tannici, āā gr. xij.
Aquæ ℥iv.
M.

Tannate of zinc is formed by decomposition of the sulphate.

Injections of tincture of aloes are recommended by Gamberini,[1] of Bologne, who states that they excite only a momentary smarting sensation, and are very efficacious.

℞. Tinct. aloës ℥ss.
Aquæ ℥iv.
M.

The subnitrate of bismuth has recently come into favor. It acts as a local sedative, or, when deposited upon the walls of the urethra, may possibly serve to protect the diseased surfaces from contact. Of 52 patients treated exclusively with injections of subnitrate of bismuth, 36 recovered after an average treatment of twenty-two days.[2]

[1] Rev. de Thér. Med.-Chir., Jan. 1, 1860, p. 13.

[2] Victor de Meric; Report to the Medical Society of London, April 30, 1860.

I have found only one difficulty attending its use, viz., that it clogged up the urethra, and by its mechanical presence excited an uneasy sensation, which was only relieved by the passage of the urine. As it is not soluble in water, it should be suspended by means of mucilage, or glycerine, and the bottle be shaken before using.

℞. Bismuthi subnitratis ʒij.
Mucilaginis ℥ss.
Aquæ ℥iijss.
M.

Dr. Irwin (U. S. Army) relies upon an injection of chlorate of potassa (ʒi ad aquæ ℥viij), repeated every hour for the first twelve hours, and gradually decreasing the frequency until the second or third day, when he states, "the disease will be generally found to have ceased."

Mr. G. Borlase Childs employs an injection of the liquor hydrargyri nitratis (♏ss ad aquæ ℥i), repeated three times a day.

Western eclectics, so-called, often use hydrastin, either alone or combined with leptandrin.

℞. Hydrastin gr. x.
Leptandrin gr. iv.
Aquæ ℥iv.
M.

Finally, in many cases of gonorrhœa, simple iced-water injected after each passage of the urine, is very serviceable in allaying pain and irritation, and not inefficacious for the cure of the discharge.

Copaiba and Cubebs.—Certain drugs which appear to possess a peculiar power in arresting inflammation of the urethral mucous membrane, are called anti-blennorrhagics. The chief of them are copaiba and cubebs. Some interesting investigations made by Ricord to determine the mode of action of these agents, are given in Ricord and Hunter on Venereal. It had already been observed in practice that copaiba and cubebs had but little curative effect upon gonorrhœa of any portion of the male or female genital organs, except the urethra; and it was hence suspected that they acted chiefly by their presence in the urine, and not through the general circulation; but this fact had not been demonstrated. A man with gonorrhœa chanced to enter Ricord's ward at the *Hôpital du Midi*, who had a fistulous opening communicating with the urethra a short distance in front of the scrotum, produced by a ligature which had been applied around his penis when a child. He could at will, by separating or approximating the two edges of the fistula,

either make his urine emerge from the artificial orifice, or cause it to traverse the whole extent of the urethra. Both portions of the canal were affected with gonorrhœa.

Ricord administered copaiba to this patient, and directed him to pass his water entirely through the fistula. In the course of a few days, the disease was cured in the posterior portion of the canal, behind the artificial opening through which the urine had passed, while it remained unchanged in the anterior portion. He was now directed to make his water pass through the whole length of the canal, and in a few days more the anterior portion was also cured. By a singular coincidence, two other cases, of a similar character, soon after presented themselves in Ricord's wards, in one of which copaiba, and in the other cubebs, was given in the same manner, and the result in each was the same as in the case just described. From these experiments, Ricord concludes that copaiba and cubebs have but little influence upon gonorrhœa, unless directly applied to the diseased surface, and hence that we cannot expect decided benefit from their administration in any form of gonorrhœa, except that of the urethra in the two sexes. In gonorrhœa of the vagina or vulva, or in balanitis, they are comparatively useless.

The presence of these drugs in the urine is still further evinced by the odor which they impart to this fluid, and which is often sufficient to pervade the bedchamber occupied by the patient.

It must not, however, be inferred that copaiba and cubebs have no effect except by way of the kidneys. They are often used with benefit in other diseases than those of the urinary organs, and cannot therefore be entirely destitute of action through the general circulation. Moreover, they sometimes act as revulsives by producing copious evacuations from the bowels, and the urethral discharge is diminished as after the administration of a purge; their chief action, however, is in the manner described, by their presence in the urine.

Such being the case, it might naturally be supposed that an emulsion of copaiba injected into the urethra would have the same effect, and that thus the internal administration of so nauseous a drug might be avoided. The experiment has been tried in numerous instances, but the result has always been unsatisfactory. As stated by Ricord, both copaiba and cubebs, in passing through the digestive organs or kidneys, undergo some modification of an unknown character, upon which their curative power depends, and which cannot be imitated by art.

Dr. Hardy, of Paris, is said to have effected a cure in several

cases of vaginal gonorrhœa by giving the patients copaiba, and directing them to inject their urine into the vagina after each act of micturition. This course, however, is more interesting as an experiment than worthy of imitation in practice.

M. Roquette, of Nantes, states that he has cured two patients who happened to be rooming together, by giving copaiba to one of them and directing the other to inject his friend's urine.[1] Testimony on this point, however, is not uniform. In a recent number of the Gaz. Méd. de Lyon,[2] Diday says: "We seize the present occasion to confess, that injections, and even the retention within the urethra, of urine containing copaiba—a mode of treatment proposed by ourselves in 1843—has not had in our hands the same success as reported by other authors, or as theoretical considerations would lead us to expect."

It was formerly supposed that copaiba could be used with safety only in gleet, and even then in very small doses, and that it was inadmissible in gonorrhœa, especially in its acute stage, having a tendency, as was thought, to excite inflammation of the neck of the bladder and swelled testicle. In the latter part of the last century, however, it was discovered that the natives of South America were in the habit of administering copaiba in large doses in all stages of gonorrhœa, and this, too, with very great success. This led to a bolder method of administering it, and it was soon ascertained that its curative effect is much greater in the acute than in the chronic form of urethritis, and that it is rarely, if ever, productive of those complications which were once attributed to it.[3] In short, it would appear that copaiba can be administered with safety and to much greater advantage in the acute stage of gonorrhœa, or at an early period of the stage of decline than afterward, and the same is true of cubebs. Still, when a case of this disease presents itself with marked inflammatory symptoms, it is usual to wait for a day or two until these have been somewhat subdued by the means already mentioned, before commencing with copaiba or cubebs, and I do not think that any time is thus lost; and, in all cases, the effect of the remedy is promoted by the previous exhibition of a cathartic. The diuretics and alkalies, spoken of in connection with the acute stage, may be combined with these drugs, as in some of the formulæ to be mentioned presently, or may be given separately.

[1] Accidents Déterminés par le Copahu, L'Union Méd., Dec. 19, 1854.

[2] For June 16, 1863.

[3] For an interesting history of the remarkable change in medical opinion with regard to the administration of copaiba, see Trousseau, Traité de Thérapeutique, vol. ii. p. 592.

The dose of copaiba is from twenty minims to one or even two drachms, repeated three times a day. It may be given in its pure state upon coffee, wine, or milk, but it is so disagreeable to the palate, and so likely to excite nausea, eructations, and even vomiting, that few persons can tolerate it in this form. To render it more acceptable to the taste and stomach, it is generally given in combination; and other ingredients are often added for the purpose of assisting its action upon the urethra. The "Lafayette mixture" in common use may be made much more acceptable to the palate by the addition of extract of liquorice, as follows:—

℞. Copaibæ ℥j.
Liquoris potassæ ʒij.
Ext. glycyrrhizæ ℥ss.
Spiriti ætheris nitrici ℥j.
Syrupi acaciæ ℥vj.
Olei gaultheriæ gtt. xvj.

Mix the copaiba and the liquor potassæ, and the extract of liquorice and sweet spirits of nitre first separately, and then add the other ingredients.

Dose.—A tablespoonful after each meal.

The following are also useful formulæ—

℞. Olei copaibæ,
" cubebæ, āā ʒj.
Aluminis ʒij.
Sacchari albi ʒiv.
Mucilaginis ʒiij.
Aquæ ℥ij.
M.

Dose.—A teaspoonful three times a day.

℞. Copaibæ,
Liquoris potassæ, āā ʒiij.
Mucilaginis acaciæ ℥j.
Aquæ menthæ viridis q. s. ad ℥vj.
M. (Milton.)

Dose.—One ounce three times a day.

℞. Copaibæ ʒx.
Tincturæ cantharidis,
Tincturæ ferri chloridi, āā ʒij.
M.

Dose.—From half a teaspoonful to a teaspoonful.

But in whatever way combined, many stomachs will not tolerate copaiba in a liquid form; hence I commonly prescribe the solidified mass, formed by the addition of magnesia, and known in the *U. S. Dispensatory* as Pilulæ Copaibæ. It requires some little tact to prepare this mass; or, rather, difficulty is met with, unless the proper kind of copaiba be used. Two kinds of the balsam are found in commerce, one of which, the best, is solidifiable with magnesia, and

the other not. The solidified mass should be divided into pills, each of which may contain five grains; and it is desirable to coat them with sugar, both for the purpose of preventing their adhering together, and to render them more acceptable to the palate. This is to be accomplished in the following manner: Put the pills into a vessel with sufficient water to moisten them; then turn them out upon a pan and sprinkle over them finely powdered sugar, at the same time rolling them about by shaking the pan, so that they may be entirely and equally coated. This process may be repeated after they are dry, as many times as is necessary to give them a thick coating of sugar. The dose is from four to eight pills three times a day. Thus prepared, they leave no taste in the mouth, and, being slowly dissolved in the stomach, are much less likely to excite nausea than the liquid article.

We have another anti-blennorrhagic, but little if at all inferior to copaiba, in the powdered berries of the Piper Cubeba. Cubebs possess the advantage over copaiba of being far less disagreeable to the taste, and less likely to excite nausea, eructations, vomiting, and diarrhœa; and, on this account, are often to be preferred in the treatment of gonorrhœa. They cannot be relied upon, however, unless freshly powdered, and preserved in a glass vessel; since the essential oil which they contain is rapidly absorbed by any porous material. Cubebs are conveniently taken, mixed in sweetened water, in the proportion of one to two drachms of the powder to half a glassful of the liquid; and this dose should be repeated three or four times a day.

Cubebs are often advantageously combined with iron, especially for persons of weak habit, thus:—

℞. Pulveris cubebæ ʒij.
Ferri carbonatis ʒss.
M. et ft. pulv.

To be taken three times a day.

Cubebs and copaiba may be combined together in the same prescription.

℞. Copaibæ ℥ij.
Pulveris cubebæ ℥j.
Aluminis ʒiss.
Magnesiæ q. s. ut fiat massa.

To be divided into pills containing five grains each, of which from four to eight are to be taken three times a day.

℞. Pulveris cubebæ ℥iij.
Copaibæ ℥iss.
Aluminis ʒij.
Sacchari albi ℥j.
Magnesiæ ʒiss.
Olei cubebæ,
Olei gaultheriæ, āā ʒj.
M.

This mixture forms a paste, of which the patient may be directed to take a piece the size of a walnut, after each meal. The following prescription is particularly adapted to delicate stomachs:—

℞. Copaibæ ℥ij.
Magnesiæ ʒj.
Olei menthæ piperitæ gtt. xx.
Pulveris cubebæ,
Bismuthi subnitratis, āā ℥ij.
M.
To be divided into pills of five grains each, and coated with sugar.

℞. Copaibæ ℥j.
Magnesiæ ʒss.
Pulveris cubebæ ℥iss.
Ammoniæ carbonatis ʒij.
Ferri sulphatis ℈j.
M. (Méot.)
To be divided into pills of five grains each: dose, three, three times a day.

Copaiba and cubebs may also be obtained enveloped in capsules of gelatin, and this is a popular form of administration. The capsules obviate the disagreeable taste of these drugs, but they do not always prevent nausea and eructations, when their contents are suddenly discharged into the stomach, by the solution of the envelope. In such cases, we may employ the French *dragées* which have been introduced within the last few years, and of which there are several varieties; some containing copaiba alone, others cubebs, and others still both these drugs combined with iron; I have found them all to be very reliable. The dose is from four to six, three times a day.

Injections of an emulsion of copaiba into the rectum, in cases where it is not borne by the stomach, have been recommended, especially by Velpeau. I have never tried this method of administering copaiba, and should have but little faith in its efficacy. It is acknowledged that a much larger quantity must be used than when it is given by the mouth. A simple injection should first be employed to clear the rectum of fecal matter, when the following mixture may be thrown in:—

℞. Copaibæ ʒv.
Ovi vitelli No. j.
Extracti opii gr. j.
Aquæ ℥viss.
M.

The nausea, eructations, and diarrhœa, which are often excited by copaiba, have already been referred to, and sometimes render it impossible to administer this remedy in any form to a delicate stomach. The diarrhœa may often be controlled by the combination of alum or an opiate, but more frequently requires the drug to be suspended, and afterward resumed in smaller doses.

Copaiba sometimes, also, gives rise to a cutaneous eruption, belonging to the class of exanthemata, as roseola, erythema, or urticaria. Such eruptions should be carefully distinguished from those of secondary syphilis, as may readily be done by the absence of coexisting syphilitic symptoms, by the itching that usually, but not always, attends them, and by their disappearance in a few days after the copaiba is suspended. The administration of copaiba should never be continued, if it produce this effect.

Another unpleasant symptom not unfrequently occasioned by copaiba, is pain in the region of the kidneys, dependent upon congestion of those organs. A few years ago, a patient was under my care for gonorrhœa, who had previously had several attacks of hæmaturia. Contrary to my advice, he took copaiba, which induced a return of the blood in his urine, and I afterwards learned that the administration of this drug had already produced a similar effect in a former attack of gonorrhœa. I always consider the presence of pain in the kidneys an indication that the copaiba should be omitted; for we have no right, in these days when renal disease is so common and a healthy kidney so rarely met with at a post-mortem examination, to subject our patients to the risk of permanent injury.

Cubebs may occasion, though much more rarely, any of the unpleasant symptoms just mentioned as likely to occur from copaiba. Both of these drugs, in large doses, will, in rare instances, excite severe headache, giddiness, and even more serious symptoms connected with the nervous centres. Ricord mentions a case of temporary hemiplegia, and another of violent convulsions, produced by copaiba; in both instances, these serious symptoms were followed by the outbreak of a cutaneous eruption, also dependent on the drug.

The anti-blennorrhagics now mentioned, are of undoubted efficacy in the treatment of many cases of gonorrhœa, but in others they

utterly fail; nor have we any means of distinguishing these two classes of cases beforehand. As I have already stated, I think they hold a second rank to injections in the cure of this disease, and in much the larger proportion of the cases that come under my care, I have ceased to employ them at all. As a general rule, if they are likely to prove successful, their good effect will be apparent in a fortnight or three weeks from their commencement, and if, by this time, the disease continue unabated, they should be omitted, and other means employed to effect a cure. When long continued, they produce disorder of the digestive functions, impair the appetite, and induce general malaise and debility; a condition of the system highly calculated to prolong the duration of gonorrhœa. Though often of marked benefit, they are by no means indispensable in the treatment of every case of gonorrhœa.

Preparations of the Gelseminum Sempervirens are much employed at the South, given internally, in the treatment of gonorrhœa; but in my hands have not proved of much benefit. This plant acts primarily on the nervous centres, and in full doses produces staggering in the gait, dimness of sight, and double vision. In one of my patients who was taking it, the double vision was due to paralysis of the motor oculi of each eye, which passed off soon after the drug was suspended. The most convenient form for administration is Tilden's fluid extract, the dose of which is about fifteen drops three times a day, gradually increased until dimness of vision or staggering in the gait is perceived.

Obstacles to Success.—A mistake, generally committed by patients who treat themselves for gonorrhœa and by some physicians, especially in the early years of their practice, is over-medication and a neglect of the general health. Nothing is more common than to meet with a patient, suffering with gonorrhœa of several months' standing, who has been kept on low diet, and been taking various preparations of copaiba and cubebs, using a variety of injections often exceedingly irritant in their composition or strength, and who is now run down, weak in body and despairing in mind. His digestion is impaired, his appetite gone, and his clap as bad as ever. Let such a man lay aside his capsules, pills, powders, mixtures, and irritant injections; give him substantial food, and a tonic, as quinine or iron; limit the special treatment of his disease to a weak astringent injection, as from one to three grains of acetate of zinc to the ounce of water, and his disease will probably begin to improve at once, and subside entirely in the course of a few days or weeks. Under any circumstances, you will have removed one great obstacle

to a cure, and if the discharge do not entirely disappear, it is probably kept up by some local complication, which can now be attacked with a prospect of success. The following is a type of this class of cases.

CASE.—P. A., aged 19, applied to me on May 5th, 1857, for a gonorrhœa which he contracted about the middle of January. He had been under the care of several physicians, and had treated himself a portion of the time; had taken copaiba in almost every form, and cubebs in large quantities; and had used strong injections of nitrate of silver, sulphate of zinc, alum, and acetate of lead. He was now much debilitated, and complained of general malaise and loss of appetite, and the discharge was still copious. I passed a bougie to ascertain if he had stricture, but could discover none. I then directed him to abstain from all anti-blennorrhagics and to live well, and prescribed five grains of citrate of quinine and iron to be taken with each meal, and an injection of sulphate of zinc, three grains to the ounce.

In one week from the time I first saw him, the discharge had disappeared. There was a slight return of it a few days afterward, which lasted only for a day or two, and did not again appear.

In the large class of cases of which this is a type, the disease is kept up by a debilitated condition of the system, and requires for its removal general hygienic measures, and in most cases tonics. I have found the citrate of iron and quinine, and the tincture of the chloride of iron, most serviceable.

Independently of debility, the chief causes of the continuance of a gonorrhœal discharge are the existence of stricture and irritation of the neck of the bladder. It is desirable in every obstinate case to ascertain if the former be present by the passage of a full-sized bougie, and if any obstruction be met with, appropriate treatment should at once be adopted; but even in the absence of stricture, the introduction of an instrument into the bladder two or three times a week has a most beneficial effect upon old cases of clap.[1]

It sometimes happens that a case of gonorrhœa has been going on well for a week or ten days under the use of the anti-blennorrhagics and injections—the discharge has almost entirely ceased, and the patient considers himself nearly well, when suddenly a relapse takes place; the discharge is once more thick and purulent; the scalding in making water returns; the injection, which has scarcely been felt for a number of days, excites considerable pain, and at the same time the patient has a frequent desire to pass his urine, and

[1] See chapter on Gleet.

suffers from an uneasy sensation in the perineal region. The latter symptoms denote that the disease has extended to the deeper portion of the urethra, and that there is irritation or inflammation of the neck of the bladder. Under these circumstances, the case requires to be very carefully watched and judiciously treated. Unless great care be used, the inflammation may extend through the vas deferens to the scrotal organs, and swelled testicle ensue; or the prostate gland may become involved. If irritant injections now be used, they will prove inefficient and will aggravate the symptoms. It is best to suspend the use of injections altogether, and to resort to the exhibition of alkalies and sedatives, as recommended in the inflammatory stage, until the subsidence of the symptoms shall enable us to resume direct treatment; the patient should also be particularly careful with regard to exercise. Canada turpentine, the product of the *Abies Balsamea*, will also be found of essential service in these cases, in place of the anti-blennorrhagics, which should be omitted. It may be made into pills containing five grains each, of which from six to twelve should be taken daily. I have also been much pleased with the effect of tincture of ergot, administered in drachm doses three times a day.

Treatment of Special Symptoms.—It remains to speak of the treatment of certain special symptoms which may attend a case of gonorrhœa, and one of the most annoying of these is chordee. Various sedatives are employed for the relief of this symptom, among which camphor holds the first rank. This may be given in the form of a pill, combined with extract of lettuce or opium, as in the following formulæ:—

℞. Lactucarii,
Pulveris camphoræ, āā ʒij.
M. ft. pil. xx.

Dose.—Two at bedtime. (Ricord.)

℞. Pulveris camphoræ ʒiss.
Pulveris opii gr. x.
M. ft. pil. No. x.

Dose.—One or two. (Ricord.)

Mr. Milton prefers camphor in a liquid form in large doses. He directs the patient to take one drachm of the tincture in water on going to bed, and every time he wakes up with chordee, to repeat the dose. He states that after the continuance of this treatment for two or three nights all tendency to chordee disappears.

Lupulin is another remedy of undoubted power in allaying the excitability of the genital organs, and possesses the advantage over

opium that it does not constipate the bowels. It may be given in doses of fifteen grains, triturated in a mortar with sugar. This quantity is to be taken before going to bed, and may be repeated one or more times in the night if required.

Of the above means of relieving chordee, I regard Mr. Milton's method of giving camphor, if it do not disagree with the stomach, and the administration of lupuline, as the best; yet none of the remedies mentioned can be relied upon with certainty of producing the desired effect, for they all fail in many instances. Much may be accomplished by directing the patient to avoid eating or drinking for some hours before going to bed, to be careful to empty his bladder and rectum, and to sleep on a hard mattress, with but few bedclothes over him. The position in bed is also of importance, since erections are much less likely to take place when lying upon the side than upon the back. I have sometimes directed a suppository of hyoscyamus and belladonna to be introduced into the rectum with good effect.

Another means of relief which I have found highly successful is bathing the genital organs in very hot water directly before going to bed. The reaction after the application of heat has a sedative effect, and in this respect has exactly an opposite influence to that of the cold lotions which are sometimes advised.

Hemorrhages from the urethra, occurring during erections, if slight, require no treatment. When copious, they are to be arrested by quiet, the horizontal posture, the application of ice externally, and the injection of ice-water into the canal; and severe cases may require compression effected by the introduction of a bougie within the urethra, and a bandage around the penis, or a compress to the perineum.

If abscesses form along the course of the urethra, they should be opened at an early period, for fear that they may break internally, and thus give rise to urinary abscess and fistula.

As an attack of gonorrhœa is passing off, it not unfrequently happens that the discharge assumes an intermittent character, entirely disappearing for a few days, and then, without apparent cause, reappearing for a day or two. This may occur several times in succession, and in some cases that I have witnessed, it has assumed great regularity. The surgeon should, of course, assure himself that the return of the symptoms is not due to imprudence, and, if satisfied of this, is generally safe in telling the patient that his disease will soon cease entirely to annoy him.

It is important to continue treatment for some days after all traces

of the disease have passed away, since relapses are very readily induced. They are usually brought on by the patient's neglecting the rules with regard to exercise, diet, etc., already laid down, or by his indulging in sexual intercourse. He should be particularly cautioned on these points, and should be directed to continue his medication, both external and internal, in decreasing doses, for at least ten days after the lips of the meatus have ceased to be glued together in the morning. Until every symptom of gonorrhœa has disappeared for this length of time, the patient cannot consider himself as securely well, and should still be cautious in his habits for a fortnight longer.

After the entire cessation of the discharge, patients sometimes complain of abnormal sensations in the genital organs, which they describe under the names of "tickling," "crawling," and sometimes "lancinating," and which may be nearly constant or intermittent at intervals of several hours or several days. These sensations, in most cases, are not dependent upon inflammation or organic changes in the part, but are of a strictly neuralgic character. They are best relieved by the passage of a full-sized sound every few days; and they are much less felt when once the mind is set at rest with regard to any danger of a return of the gonorrhœa.

The reader may be interested to know what is the average duration of treatment required in the hands of the best surgeons for the cure of gonorrhœa, laying aside those cases which are seen in the first stage, and which are speedily cured by the abortive method. This may be estimated at three or four weeks. Greater success, on the average, is probably not attainable by any means with which we are at present acquainted.

CHAPTER II.

GLEET.

THE term "Blennorrhœa," or, in common parlance, "Gleet," is applied to a slight and chronic discharge from the male urethra, unattended with symptoms of acute inflammation.

Gleet generally follows without interval an attack of gonorrhœa, as a consequence of the neglect or unsuccessful treatment of the latter; and, as the acute gradually subsides into the chronic disease, it is impossible clearly to define a line of demarcation between them, and to say when the former ceases and the latter begins. In many cases, however, gonorrhœa runs through its successive stages and is apparently cured; when, after an interval of several weeks or even months, the patient returns with the report that he has recently noticed in the morning on rising that the lips of his meatus adhere together, and, on separating them, that the urethra contains a small amount of matter; he suffers no pain or inconvenience, but is still anxious about his discharge and desires to be free from it. In such instances, it is probable that the cure of the preceding urethritis was only apparent, and that a slight degree of inflammation was left in the deeper portions of the canal, not manifesting itself externally until aggravated by some exciting cause, as coitus, alcoholic stimulants, fatigue, etc. Or, again, it is not improbable that there is a stricture of the urethra, which is the most frequent cause of the continuance of a gleety discharge following an acute attack of gonorrhœa. Other organic changes may exist within the canal and be productive of gleet, as vegetations similar to those met with upon the internal surface of the prepuce, and in rare instances, polypoid growths.[1]

Idiopathic gleet, or gleet not preceded by acute urethritis, may be dependent upon various affections of the prostate, and especially upon the hypertrophy of this gland so common in old men. It may also arise from disorder of the digestive function, and from disease

[1] See THOMPSON on Stricture, p. 78 et seq.

of the bladder or kidneys, whereby the urine is rendered abnormally irritant.

Gleet is often maintained by a state of general debility, or by a strumous, rheumatic, or gouty diathesis. That general debility is a fruitful source of the persistence of gleet, is evident from the frequency of this disease in persons of broken-down constitutions, and from the beneficial influence of tonics and general hygienic measures in its treatment. Again, gleet is peculiarly frequent and obstinate in persons of a strumous diathesis who are subject to chronic inflammation of other mucous membranes, and under such circumstances is benefited by the administration of anti-strumous remedies. The influence of rheumatism and gout in the production of discharges from the urethra has already been mentioned in connection with gonorrhœa.

Symptoms.—In many cases of gleet, the discharge is the only symptom. There is an entire absence of pain in the part, of redness and tumefaction of the lips of the meatus, and of scalding in passing water. In some instances, however, the patient experiences a feeling of uneasiness in the penis or perineum, or an itching about the glans or in the deeper portions of the canal, which may either be constant or attendant only upon the passage of the urine. Again, at the first act of micturition in the morning, the obstruction offered to the exit of the stream by the matter which has dried around the meatus and glued its lips together, often gives rise to forcible distention of the canal, and a sharp momentary pain in the urethra, which may be avoided by previously separating the lips of the orifice.

The discharge in gleet varies in its character, quantity, and in the time of its appearance. In some cases it is evidently purulent, especially when the gleet has followed a recent attack of gonorrhœa. In other instances, it is perfectly transparent, and, examined under the microscope, is found to consist of a clear fluid, containing epithelial cells and free nuclei, either with or without a few pus-globules. Again, coagulated masses, like the white of an egg, are sometimes forced from the canal. In some cases, the discharge is constant, and sufficiently copious to stain the linen; but in the majority it is perceptible only in the morning on rising. When dependent upon inflammation of the deeper portions of the canal, or of the prostate, it may only appear during the efforts of the patient at stool, or be mingled with the last drops of urine in micturition. The small amount of the discharge in most cases of gleet,

and the frequency of this disease among soldiers, has given rise to the name "goutte militaire," employed by the French.

The symptoms of gleet now described are liable to be aggravated by any cause which produces urethral or vesical irritation. In other words, a gleet is readily transformed into a clap. A hearty meal, alcoholic stimulants, free sexual indulgence, violent exercise, a long ride, or exposure to sudden changes of temperature, may bring on a copious purulent discharge, attended by tumefaction of the parts, scalding in micturition, and all the symptoms of acute gonorrhœa. Only a few hours are required for this change to take place, and, hence, we may explain the sudden reappearance of some attacks of gonorrhœa—often supposed to be due to fresh contagion —when patients, too confident that they are well, are hasty in indulging in drink or coitus.

Hunter, in his work on Venereal, states that "a gleet is perfectly innocent with respect to infection," and that in the relapses which so frequently occur, "the virus," in his opinion, "does not return." This statement, although often refuted, still finds place in many elementary works, which are in the hands of medical students. A doctrine more dangerous to the peace of families could scarcely be promulgated. It is, indeed, true, that men are occasionally met with who have for years suffered from gleet, and who have yet had frequent connection with their wives with impunity, but where contagion ceases and immunity begins, no one can tell; and even if we were able to pronounce a discharge of a certain degree of purity innocuous, we could not foresee the effect upon it of a few hours' sexual indulgence. It may at the present moment be wholly mucous, and entirely innocent of contagious properties, and yet a short time hence be purulent, and in the highest degree dangerous. The fact is, no one can pronounce sexual congress safe, so long as a urethral discharge exists, and in replying to the frequent questions of patients on this point, the surgeon should not only avoid incurring the responsibility of allowing it, but do all in his power to dissuade from it.

PATHOLOGY.—Our knowledge of the pathology of gleet is somewhat imperfect, since the urethra is beyond the reach of direct observation, and opportunities for making post-mortem examinations of persons affected with this disease are very rare. There can be no doubt, however, of the general truth of the law that, while the straight or anterior portion of the urethra is affected in gonorrhœa, the posterior and curved portion is the most frequent seat of

gleet, as evinced by the extension of the inflammation in many cases to the testicle, the uncomfortable sensations experienced by the patient in the perineum, and the difficulty of curing the disease by means of injections, unless the fluid be made to enter the deeper portions of the canal; moreover, after the spongy urethra has been freed of its discharge by pressure along the under surface of the penis, an additional quantity may generally be forced out from the bulbous and membranous portions by pressure upon the perineum.

In the few post-mortem examinations which have been made of persons affected with urethral discharges, sufficient attention has not been paid to the duration of the disease nor to the symptoms during life. The most minute description of the pathological appearances of gonorrhœa and gleet is the one given by Rokitansky, who says: "We find the anatomical characters to be those belonging to catarrh generally; in the acute stage there is, according to the violence of the process, redness, injection, tumefaction of the urethral mucous membrane, or secretion of puriform mucus; in the chronic stage there is tumefaction of the mucous membrane, enlargement of the follicles, relaxation of the sinuses, and a white or colorless secretion. The inflammation is either uniformly diffused over the urethra, or is limited to one or more spots. The latter is especially the case in genuine gonorrhœa of the male urethra; we here find not only the navicular fossa, but every point as far as the prostatic portion, and especially the vicinity of the bulb of the urethra liable to become the seat of the disease. When the gonorrhœa is very violent and obstinate, a small tubercular swelling, which results from the deposition of fibrous matter in the spongy tissue of the urethra, is found at these points."[1]

Mr. Thompson has found nearly the same appearances: "Observation demonstrates that the two spots which suffer most from gonorrhœal inflammation, are the fossa navicularis and the bulb; I have had opportunities of observing this two or three times in the dead-house, on the bodies of patients who had been suffering from gonorrhœa shortly before death. Unusual vascularity is found in the latter situation, particularly if the affection have been chronic, while the intermediate part appears comparatively very little affected. There is a preparation in the Museum of St. George's Hospital, which exhibits the urethra of a patient who died while suffering from gonorrhœa, in which an ulcer exists (the only one to be seen) in the commencement of the membranous portion."[2] It is

[1] Pathological Anatomy, Sydenham Society's Translation, vol. ii., p. 233.
[2] Stricture of the Urethra, p. 84.

impossible to determine whether the ulcer in the case referred to by Mr. Thompson was a chancroid or chancre, or a superficial erosion such as is met with in balanitis; it was probably one of the former, since gonorrhœal inflammation rarely produces ulcerations involving the whole thickness of the mucous membrane and capable of detection in a preparation that has been preserved for a long time in spirit.

The lacuna magna upon the superior wall of the fossa navicularis is probably, in some instances, the source of the discharge in gleet, since it is peculiarly exposed from its situation to participate in the inflammation of gonorrhœa, and its internal surface is not readily accessible to injections. Dr. Phillips states that he has succeeded in curing four obstinate cases of gleet by introducing a director along the upper surface of the urethra until its extremity entered the lacuna magna, and slitting up the wall of the follicle with a narrow bistoury.

When the disease is situated in the deeper portions of the canal, we may sometimes determine its seat by the introduction of a bulbous pointed sound or bougie. The patient flinches when the affected part of the canal is reached, and the enlarged extremity of the instrument meets with slight obstruction from the thickened mucous membrane.

It appears, therefore, that the pathological changes of gleet are similar to those met with in chronic inflammation of other mucous membranes, as the conjunctiva, tear passages, and the external meatus auditorius, and the extension of the inflammatory process to the membrane lining the follicles and the ducts which open into the deeper portions of the urethra, may account for the well-known persistency of the disease, which is almost proverbial.

TREATMENT.—The treatment of gleet should be addressed to the general condition of the patient as well as to the local disease. It may be laid down as a rule to which there are but few exceptions, that in gleet the tone of the general health is more or less reduced. Not that all patients with gleet are necessarily weak and emaciated; on the contrary, many appear to be robust and hearty; but it is almost always the case that they are not capable of the same amount of exertion as formerly; they are sensible that they have lost a portion of their animal vigor; and the benefit of general hygienic measures and tonics in their treatment is unmistakable. The diet should be plain but substantial, consisting of fresh meat, vegetables, eggs, etc., to the exclusion of salt meats, cheese, and highly-seasoned

articles; and secretion from the skin should be promoted by means of frequent sponging or bathing. With regard to exercise, although a long walk or ride, especially when carried to fatigue, will be found to aggravate the discharge, yet when commenced with moderation, and gradually and steadily increased in proportion to the strength, it is found to be highly beneficial. Healthy exercise of the mind is no less important than that of the body, and the attention of the patient should be distracted as much as possible from his disease, and all books and associations calculated to excite the passions be avoided. The bowels should be opened daily, if possible by selecting such articles of food as are laxative, and by regularity in the hour of going to the closet, or, if required, by the administration of medicine. One of the following pills taken at bedtime, will usually insure a free stool in the morning.

℞. Strychniæ gr. ss.
Pil. colocynth. comp. ʒss.
M.

Divide into thirty pills.

In the tincture of the chloride of iron, we have a most valuable combination of a tonic and an astringent; which, in most cases of disease of the generative organs in the male and female, is unequalled by any of the more modern and elegant preparations of this mineral. It may be given in doses of from five to twenty drops, largely diluted with water, three times a day, directly after meals. If the dose be properly graduated, it less frequently excites headache in the male than the female; should this unpleasant symptom occur, iron reduced by hydrogen may be substituted for it, in doses of three grains, three times a day. Where the constitutional debility is marked, the union of quinine with iron may be desirable, as in the following:—

℞. Ferri et quiniæ citratis ʒj-ij.
Aquæ ℥j.
Syrupi limonis ℥ij.
M.

A teaspoonful after each meal.

℞. Tincturæ cantharidis ʒj.
Quiniæ sulphatis ʒss.
Tincturæ ferri chloridi ʒij.
Acidi sulphurici dilutigtt. xxx.
Aquæ destillatæ ℥viij.
M.

One ounce three times a day. (Childs.)

Other salts of iron, as the tartrate of iron and potassa, or the pyrophosphate of iron, may be substituted for the citrate, in the first of the above prescriptions.

In the administration of iron I have always found a rule laid down by Trousseau, a good one, viz., not to stop the medicine suddenly; after the object for which it is administered has been attained, it may be omitted for a fortnight, when it should again be resumed for a few weeks; in this way its effect is rendered much more permanent.

With patients of a strumous diathesis, cod-liver oil, the syrup of the phosphates, or Blancard's pills of iodide of iron, may often be used with advantage. I have found that the iodide of potassium has a tendency to increase the discharge from the urethra, as it often does the secretion from other mucous membranes, and I do not therefore administer it. This effect of the iodide may frequently be observed, when we are giving it for tertiary syphilis to patients, who, at the same time, are affected with gleet.

From what has already been said of copaiba and cubebs, it is evident that but little good can be expected from their administration in cases of chronic urethral discharge. Moreover, most patients whose disease has arrived at this stage, have already taken them *ad nauseam* for the preceding gonorrhœa; hence, we are rarely called upon to administer them in pure gleet. In those cases, however, in which the gleet has relapsed into a clap, they may be given with benefit, especially when combined with a tonic, as in the *dragées* of copaiba, cubebs, and citrate of iron; in Méot's pills, the formula for which has already been given; and as in the following prescription:—

℞. Copaibæ ℥ss.
Tincturæ cantharidis ℥ss.
Tincturæ ferri chloridi ℥j.
M.

Dose.—Thirty drops three times a day.

The reader will observe that the tincture of cantharides is an ingredient of several of the above prescriptions. Experience has shown that this drug exerts a decidedly curative action in many cases of gleet, and in gonorrhœa also, in the chronic stage. It is a favorite remedy with the homœopaths, in doses of a drop of the tincture every few hours, in the acute stage of clap, and is considered by them to be indicated by scalding in micturition, chordee, and a greenish or bloody discharge. I have used it, however, only in the chronic stage. The tincture may be given in doses of three or five drops three times a day, or it may be combined with iron, as follows:—

℞. Tincturæ cantharidis ʒij.
Tincturæ ferri chloridi ʒvj.
M.

Ten drops in water, three times a day.

In some cases of gleet there is considerable irritability of the neck of the bladder, as shown by a frequent desire to pass the urine and unpleasant sensations in the perineum. In these cases benefit will be derived from the administration of the salts of potash, combined with hyoscyamus, as in the prescriptions already given when speaking of the acute stage of gonorrhœa. Wine of ergot is also an excellent remedy under these circumstances.

Bougies.—In all cases of gleet, the urethra should be carefully examined with a full-sized bougie or sound, in order to detect the presence of stricture; and if the slightest contraction be discovered, it should at once receive appropriate treatment, since upon its removal will probably depend the cure of the discharge. Dr. Charles Phillips, whose name is little known to the American public, but who in Paris has acquired an enviable reputation in diseases of the genito-urinary organs, states that gleet is almost invariably dependent upon slight stricture, which may be detected by means of bulbous-pointed and knotted bougies, but which is frequently overlooked from the want of careful exploration with proper instruments.[1]

Whatever may be the truth of this statement, which, to say the least, requires confirmation, the frequent passage and retention of bougies is one of the best means known for the treatment of gleet, even when no stricture can be discovered by the ordinary mode of examination. The manner in which bougies effect a cure of chronic urethral discharges is somewhat obscure, but is probably to be explained on the ground that they distend the canal, expose lacunæ in which matter would otherwise lodge, and separate for a time the diseased surfaces; or, again, they may serve to stimulate the vessels of the part, and thus change their action.

Bougies tapering towards the extremity and terminating in an olive-shaped point, are well adapted for the purpose. They are introduced easily and with little inconvenience to the patient, and the contraction near their point facilitates the introduction of medicated ointments into the deeper portions of the canal. The instrument should be large enough fully to distend the canal but not to stretch it, and should be smeared with cerate, lard, olive or castor oil, or glycerin. The bladder should previously be emptied and the patient placed in the recumbent posture. However gently it may be introduced, the first passage of a bougie usually excites a more or less disagreeable sensation, which sometimes gives rise to syncope, and which generally renders it advisable to withdraw the instrument

[1] Traité des Maladies des Voies Urinaires, Paris, 1850, p. 32.

in a few minutes; but after two or three insertions it ceases to give annoyance, and may be retained for half an hour or an hour.

It sometimes happens that the bougie aggravates the discharge, and revives the acute inflammation which has for a time disappeared. In such cases it is best to suspend the treatment and resort to injections, which will often effect a permanent cure. This aggravation of the symptoms, however, according to my experience, takes place in a minority of cases only.

With this exception, the passage of the bougie may be repeated every second or third day at first, and afterwards every day, or in some instances as often as twice a day. The length of time requisite for a cure by means of bougies varies in different cases. As examples of their successful employment I may mention one case recently under my care, a gleet of four years standing, which was treated with the tincture of the chloride of iron internally, and the introduction of bougies every second day, and in which a cure was effected in two weeks. In another case, a gleet of nine months, the discharge disappeared in three weeks under the use of the same means. Other cases of a like character might be mentioned, but such satisfactory results cannot by any means be expected in every instance. In many, this treatment must be continued for several months, or other measures, as injections and blisters, be resorted to.

Bougies may be medicated in various ways. Calomel rubbed up with sufficient glycerin or oil to cover it, forms a very cleanly and excellent mixture with which to anoint the bougie, and I think materially assists the curative action. Mercurial ointment may also be used, either alone or combined with extract of belladonna, the latter being added in case the urethra is irritable.

℞. Unguenti hydrargyri ℥ss.
Extracti belladonnæ ʒss.
M.

For the purpose of stimulating the mucous membrane, we may employ the diluted ointment of red oxide of mercury, or an ointment containing a few grains of nitrate of silver, but such applications should not be continued for any length of time, lest they keep up the discharge.

℞. Ung. hydrarg. oxidi rubri ʒj.
Adipis ʒiij.
M.

℞. Argenti nitratis gr. v–x.
Adipis ℥j.
M.

Injections.—Injections have been so fully discussed in the preceding chapter, that little remains at present to be said of their composition, or the ordinary mode of their administration.

In gleet as in gonorrhœa, weak solutions of the sulphate or acetate of zinc (containing from two to three grains to the ounce of water) are in most instances to be preferred; and the injection should be made to permeate the urethra as deeply as possible, in order that it may be applied to the whole extent of the affected surface, but care should be taken not to distend the canal with too much force, the sensations of the patient being the best indication when a sufficient amount has been employed. So far as inflammation of the testicle and prostate have any connection with the use of injections, I believe they are more frequently due to violent manipulation than to the irritant character or strength of the solution. Hence, injections should always be used with gentleness, while at the same time the canal should be entirely filled, that none of the folds into which the urethral walls are naturally thrown except during the passage of the urine, may escape coming in contact with the astringent fluid. With this precaution, a weak injection may be employed to advantage every two or three hours; a degree of frequency which will often prove successful when a less degree has failed.

In addition to the formulæ for injections given in the chapter upon gonorrhœa, the following may be added:—

℞. Hydrargyri bichloridi gr. j.
Aquæ ℥viij–xij.
M.

℞. Gallæ ʒj.
Aluminis ℈ij.
Aquæ ℥viij.
M.

℞. Acidi nitrici gtt. xvj–xl.
Aquæ ℥viij.

I have recently employed with very satisfactory results the solution of persulphate of iron prepared by Dr. Squibb, as in the following:—

℞. Liq. ferri persulphatis (Squibb) ʒss.
Aquæ ℥vj.
M.

The strength of the above solution may, in some instances, be increased.

Ricord advises solutions containing iodine in scrofulous subjects,

and although the injection of this mineral into the urethra cannot be supposed to affect the constitutional diathesis, yet it may exert a beneficial action upon the mucous membrane as when applied to the fauces.

℞. Tinct. iodinii gtt. viij.
Aquæ ℥viij.
M. (Ricord.)

℞. Ferri iodidi gr. viij.
Aquæ ℥viij.
M. (Ricord.)

I will here repeat a suggestion previously given, that the use of any medicated injection, and especially one containing insoluble ingredients, will prevent even a sound urethra from exhibiting its normal dryness. Without due caution, therefore, a patient may go on injecting long after his disease is cured. Hence, after the discharge has for some time been reduced to a very minute quantity, and especially if it appear to consist of little more than the insoluble deposit of the solution, the injection should be omitted for a few days, in order that the exact condition of the urethra may be determined; or, again, it may be administered only once in the twenty-four hours, selecting for the purpose the early part of the day, and the appearance of the meatus the following morning will indicate what progress has been made towards a cure.

Substitutive medication is sometimes employed in gleet as in the abortive treatment of the first stage of gonorrhœa. Thus, highly irritant or caustic injections are used with the intention of exciting acute inflammation, upon the subsidence of which the chronic affection may perhaps disappear. Nature accomplishes the same result in the same manner, when, as sometimes happens, after the cure of a fresh attack of gonorrhœa no traces remain of a preceding gleet. Substitutive treatment, however, is less successful in gleet than in the early stage of gonorrhœa, since the seat of the disease is less accessible and the mucous membrane more deeply affected, moreover, it is less safe, since an irritant injection extended to the deeper portions of the canal is more liable to induce swelled testicle than when limited to the fossa navicularis.

Either nitrate of silver or chloride of zinc is most frequently employed in the substitutive treatment of gleet, and, as in the abortive treatment of gonorrhœa, the solution may be a strong one and injected but once, or weak and repeated a number of times. For instance, the surgeon may thoroughly and once for all inject with his own hands a solution of ten or fifteen grains of nitrate of

silver, or five grains of the chloride of zinc to the ounce of water; or a weaker solution of either (from one to five grains of the nitrate, and from half a grain to two grains of the chloride) may be injected by the patient several times a day until the discharge becomes copious and purulent, when the injections should be suspended until their effect upon the gleet can be determined.

Sometimes, as previously stated, the pain excited in a certain portion of the urethra by a bulbous pointed bougie and the slight obstruction presented by the thickened mucous membrane, will indicate the probable source of a gleety discharge; and in such instances, having first measured its distance from the meatus, the affected surface may be cauterized with Lallemand's porte-caustique.

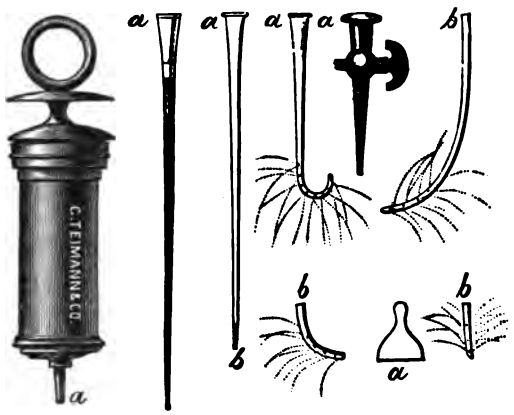
Deep Urethral Injections.—In the ordinary method of injecting the male urethra, it is impossible to make the fluid pass through the whole extent of the canal into the bladder. After a certain portion (about half an ounce) of the contents of the syringe has been injected, the remainder escapes above the piston, or, however tightly the glans may be compressed around the point of the instrument, flows from the meatus. The obstruction to the entrance of the fluid is due to the contraction of muscular fibres (the compressor urethræ muscle) which surround the membranous portion and serve as a sphincter to the urinary canal;[1] and this is the posterior limit of the application of the fluid to the urethral walls by the more common method of injecting. In order to reach the deeper portions of the canal, which are involved in many cases of gleet, it becomes necessary to resort to injections through a catheter, or by means of the "urethral syringe with extra long pipe," manufactured by the American Hard Rubber Company, or with Tiemann's "universal syringe," which is provided with a catheter extremity.[2]

The length of the urethra should be measured by introducing the catheter and marking the point in contact with the meatus when the urine first commences to flow; upon withdrawing the instrument the distance between its eye and the mark upon the stem will be the measurement required. On again introducing the catheter for the purpose of injecting (the patient having first passed his water), it is an easy matter to carry its point within half an inch of the vesical neck without entering the bladder, when the fluid may be thrown in by means of a syringe as the instrument is slowly

[1] See the section on the Anatomy of the Urethra in the chapter on Stricture.

[2] This instrument will be found very useful in the treatment of venereal diseases, for instance in deep urethral injections, in injections into the nostrils and pharynx, etc.

Fig. 1.



Tiemann's "Universal Syringe."

withdrawn. If the catheter be sufficiently large to moderately distend the canal, none of the injection will escape from the meatus so long as the eye of the instrument is in the prostatic or membranous portion of the urethra, since the contraction of the same muscle which prevents the entrance of fluid from without, also prevents its exit from within, and obliges it to flow backwards towards the bladder; hence we may, if we choose, limit the application of the injected fluid to the deeper portions of the canal exclusively, and the pain excited will be found to be less than when a solution of the same strength is thrown into the external portion, since the urethra, like other mucous passages, is most sensitive near its outlet. The chief disagreeable sensation following an injection thus confined to the portion of the urethra lying between the compressor urethræ muscle and the neck of the bladder, is an urgent desire to pass water, which, however, should be resisted as long as possible, that the fluid may have time to act upon the urethral walls before it is washed away or neutralized by the urine. During the succeeding twenty-four hours, micturition is somewhat more frequent than usual, but is not particularly painful; and the discharge is often slightly increased for a day or two.

The efficacy and safety of these injections in affections of the deeper-seated portions of the urethra is attested by MM. Diday[1] and

[1] Des Injections Circonscrites à la Partie Profonde de l'Urètre, de leur Mode d'Exécution, et de leur Efficacité Curative; Annuaire de la Syphilis, année 1858, p. 61. DIDAY's method of employing deep urethral injections has been followed in the above description.

Bonnet, of Lyons, Mr. Langston Parker,[1] of Birmingham, and my own experience. The same formulæ may be employed that have been recommended for injections by the more common method, and the application may be repeated once or twice a week.

Blisters.—Blisters were long ago recommended for the cure of obstinate cases of gleet, but had almost fallen into disuse, when they were revived by Mr. Milton, in his work on the treatment of gonorrhœa. This author speaks of them in the following terms: "I have seen two blisters, with a mild injection or two, at once cure a clap which had defied the most energetic treatment; and *as I never found a case which resisted blistering and injections together, that was not complicated with stricture or affection of the testicle, I am slowly arriving at the conviction, that every case of clap or gleet, however obstinate, may, if uncomplicated, be cured by blistering, singly or combined.*"[2] It is to be feared, however, that this remedy has proved less successful in the hands of other surgeons than in Mr. Milton's. Recent writers who have spoken favorably of it, appear to have done so chiefly on Mr. Milton's authority; others, as Mr. Langston Parker, have given their testimony decidedly against it, and in my own practice it has not been attended with such success as to lead me to prefer it to other and less disagreeable modes of treatment. Still it may be worthy of a trial in obstinate cases which have resisted the use of bougies and injections.

The manner of applying blisters to this region is of considerable importance. The hair should be shortened around the root of the penis, and a piece of paper be wrapped around the organ, and cut in such a manner as to form a pattern of its surface from the pubis to within half an inch of its extremity. The blister, corresponding in shape and size to the pattern, should be applied to the penis, and tied or fastened in its place, that it may not slip, and, coming in contact with the scrotum, produce a troublesome sore. It should not be retained longer than two hours, during which the patient must remain quiet. The morning is the best time for its application, since, if applied at night, it is likely to prevent sleep. On removing it, the surface is found to be reddened, but not vesicated, unless, perhaps, at a few points; and the penis should now be covered with a rag spread with simple cerate, and be protected from friction by an external layer of cotton wadding.

[1] Syphilitic diseases, p. 82. Mr. PARKER injects the fluid into the bladder, lets it remain for a few minutes, and desires the patient to force it out. This method is not so good as the one above recommended.

[2] MILTON on Gonorrhœa, p. 90. The Italics are in the original.

On examining the parts after a few hours, it will be found that numerous bullæ have formed on the surface, which at first appeared to be only reddened. These may be pricked, and the serum which they contain evacuated, but the epidermis should be carefully preserved. I have sometimes found the extremity of the prepuce beyond the site of the blister, puffed out with an effusion into its cellular tissue, which may be left to take care of itself, or, if excessive, be evacuated by a few punctures with a lancet.

Cantharidal collodion is a more convenient application than the unguentum lyttæ, but its effect cannot be limited like that of the latter, which should therefore be preferred. When applied for a few hours only, I can confirm Mr. Milton's statement, that blisters do not excite severe pain, nor produce a troublesome sore. The first effect of their application is to increase the urethral discharge, which can only be expected to be benefited in the course of five or six days. The blister may be repeated at the end of a week, if any discharge still remain. The perineum may be blistered in a similar manner, but this will require the patient to be kept in bed until the vesicated surface has healed.

Separation of the Affected Surfaces.—Contact of the diseased surfaces doubtless assists in keeping up the discharge in gleet, as it is well known to do in balanitis. Hence it has been proposed, by means of a probe and a gum-elastic bougie open at the extremity, to introduce a strip of lint, either dry or soaked in some astringent fluid, within the urethra, and thus maintain its walls apart, renewing the application after each passage of the urine. This method, in which I have had no experience, has been successful in some instances, but is very troublesome and inconvenient, and would appear to be attended with danger of the lint slipping entirely into the urethra, and entering the bladder. Civiale mentions a case in which this accident occurred, but does not give the ultimate result.[1] Mr. Milton[2] states that it has happened to him in several instances, and that the lint has always found its own way out, but the danger of its retention is too great to be incurred. Separation of the affected surfaces is partially effected by certain forms of injections, as those containing bismuth, calamine, and other insoluble ingredients.

Finally, in obstinate cases of gleet in which the discharge appears to come from the anterior portion of the urethra, laying open the lacuna magna, as recommended by Dr. Phillips, is worthy of a trial.[3]

[1] Maladies des Organes Genito-urinaires, vol. i. p. 444.

[2] On Gonorrhœa, p. 81.

[3] See page 105.

CHAPTER III.

BALANITIS.

If the prepuce be retracted, a mucous surface of considerable extent is exposed, a portion of which covers the glans penis, and the remainder consists of the internal reflection of the prepuce. This surface may be the seat of inflammation, similar to that which has been described as affecting the urethra. If the disease be confined, as it sometimes is, to the membrane covering the glans, it should, strictly speaking, be called balanitis; if to the internal surface of the prepuce, posthitis, and if it involve both, balano-posthitis; all these varieties, however, for the sake of convenience, are commonly included under the one name, balanitis. Gonorrhœa spuria, balano-preputial gonorrhœa and external blennorrhagia are other terms by which it is sometimes known.

Causes.—Men in whom the prepuce is very long, or who are affected with congenital phymosis, are peculiarly exposed to balanitis, since the mucous membrane covering the glans, and lining the prepuce, is maintained in so sensitive a condition, from its want of exposure to the air and friction, that inflammation is readily set up by the least cause of irritation. In persons with congenital phymosis, the mere collection of sebaceous matter, the removal of which is prevented by the occlusion of the preputial orifice, is sufficient to give rise to balanitis; and I have known of several instances in which, from inattention, the discharge was supposed to come from the urethra, and was mistaken for gonorrhœa. The diagnosis can readily be made by exposing and wiping the meatus, and then observing whether upon pressure the matter comes from the urethra, or the balano-preputial fold. Moreover, the pain in micturition extends along the course of the canal, while in balanitis it is less severe and confined to the extremity of the penis.

In general, the exciting causes of balanitis are the same as those of urethral gonorrhœa. Thus it may arise from exposure to gonorrhœal or leucorrhœal discharges, or from intercourse about the time

of the menstrual period; and, even more frequently than gonorrhœa, from coitus with a healthy woman, particularly under circumstances of special excitement, from violence, masturbation, excessive exercise, the want of cleanliness, errors in diet, and atmospheric influences. To these should also be added the presence of a chancroid, chancre, or an eruption dependent upon syphilis or other causes, upon the mucous membrane of the glans or prepuce.

SYMPTOMS.—The symptoms of balanitis are tenderness of the extremity of the penis, an itching sensation beneath the prepuce, and scalding during micturition if the urine comes in contact with the affected surface. The inflamed mucous membrane is sensitive on pressure, reddened, and often denuded of epithelium in irregular patches, which are of a darker red than the surrounding surface where the epithelium is but partially detached. These superficial excoriations are generally multiple, and are similar to the ulcerations frequently met with upon the cervix uteri. The affected surface secretes a muco-purulent fluid, varying in quantity and consistency, as in gonorrhœa. If phymosis exist and the preputial orifice be so contracted as not to afford free exit to the discharge, the matter may collect at the base of the glans and form an abscess. An effusion of serum takes place in the cellular tissue of the prepuce, rendering it more or less œdematous, and sometimes occasioning accidental phymosis. The general system sympathizes but little with the local affection, which is in most cases of short duration, and very amenable to treatment. The inguinal ganglia may, in rare instances, become slightly enlarged and sensitive, but they never suppurate.

One attack of balanitis predisposes to another. Men with a long prepuce or congenital phymosis, are often met with who have lived thirty or forty years without suffering inconvenience from their malformation, but who, after one attack of balanitis, are constantly subject to others, following intercourse with the most healthy woman, or even mere imprudence in diet.

TREATMENT.—When the prepuce can be retracted, the treatment of balanitis is exceedingly simple. All that is necessary, in most cases, is to free the parts from any collection of matter by gently washing them with tepid water, and then to cut a piece of lint or soft linen into pieces about an inch square, and laying them upon the glans with their upper margin well up in the furrow behind the corona, to draw the prepuce over them. In this manner the inflamed

surfaces are isolated from each other, and speedily take on a more healthy action. The frequency with which this application should be repeated depends upon the copiousness of the discharge; generally from two to four times in the twenty-four hours is sufficient. and a cure is usually attained in a few days or a week. In severe cases, however, other measures than those mentioned may be desirable. If the surface be excoriated, it is well to pencil it over lightly with a crayon of nitrate of silver, or to apply a solution of this salt, of the strength of a drachm to the ounce of water. Again, instead of using the lint dry, it may be moistened in either of the following mixtures:—

℞. Liquoris plumbi diacetatis ʒj.
Aquæ ℥ij.
M.

℞. Liquoris sodæ chlorinatæ ʒiij.
Aquæ ℥v.
M.

℞. Acidi tannici ʒj.
Glycerin ℥j.
M.

℞. Extracti opii ℈j.
Zinci sulphatis gr. vj.
Glycerin ℥j
Aquæ ℥ij.
M.

When phymosis, either congenital or acquired, exists, the parts are less accessible to treatment. In this case the nozzle of a syringe holding several ounces and filled with tepid water, should gently be inserted between the glans and prepuce, and its contents be discharged into this cavity, in order to free it from all collection of matter. A few drachms of a solution of nitrate of silver, or of one of the lotions just mentioned, may then be thrown up, and this should be repeated several times in the course of the day. In these cases, Mr. Langston Parker highly recommends the following preparation, introduced between the glans and prepuce by means of a camel's hair pencil:—

℞. Cerati simplicis, vel mellis,
Olei olivæ, āā ℥j.
Hydrargyri chloridi ʒss.
Extracti opii ʒj.
M.

If the balanitis be attended by much infiltration into the cellular tissue of the prepuce, the fluid should be evacuated by several punctures with a lancet. If the patient can keep his bed, the penis may also be enveloped in a single thickness of linen, wet with cold water or diluted Goulard's extract, and exposed to the air. If, however, he continues his daily occupation, no benefit can be expected from such applications, which, when confined by the clothes, act like poultices, and favor rather than prevent œdema. In all cases

the cure of balanitis will be accelerated, if the patient be kept quiet and the parts elevated. When this disease is dependent upon the presence of an ulcer, secondary eruptions or vegetations, these should receive their appropriate treatment.

With persons who have repeated attacks of balanitis it becomes an important object to take measures to prevent them. To accomplish this the strictest cleanliness should be enjoined. The parts should twice a day be cleansed of all accumulation of their natural secretion, and afterwards moistened with an astringent lotion, as a mixture of equal parts of brandy and water with the addition of alum, a solution of tannin, or any of the astringent washes already mentioned. It is also desirable to attend to the digestive functions, and to regulate the diet. The influence of a long prepuce in producing relapses of this disease has already been referred to. I have sometimes succeeded in remedying this malformation by directing the patient to keep his prepuce constantly retracted by means of a narrow bandage applied around the penis, posterior to the glans. If this be worn for a few weeks, the prepuce will often remain retracted without further assistance, and the mucous surface of the glans becomes hardened by exposure and friction. If this attempt prove unsuccessful, the superfluous integument should be removed by circumcision.

CHAPTER IV.

PHYMOSIS.

THE term Phymosis is applied to that condition of the penis in which it is impossible to retract the prepuce behind the glans.

In the majority of cases phymosis is a congenital malformation due to unnatural narrowness of the preputial orifice, and may be associated with adhesions, varying in position and extent between the glans and its covering. A remarkable instance of this kind is recorded in the Surgical Register of the N. Y. Hospital: Joseph Smith, of Prussia, aged 49, was admitted into this institution Oct. 19, 1832, with congenital phymosis. Dr. Stevens removed the free portion of the prepuce, which was found to be attached to the margin of the meatus instead of the base of the glans, and formed a tubular prolongation of the urethra nearly an inch in length.

Congenital phymosis is a source not only of great inconvenience to the subject of it, but of increased exposure to venereal diseases in promiscuous intercourse, and is sometimes the cause of serious disturbance in the genito-urinary and nervous systems.

Mr. Jonathan Hutchinson[1] has shown by statistics that syphilis is much less common among Jews than among Christians, probably on account of the practice of circumcision among the former. At the Metropolitan Free Hospital, situated in the Jews' quarter, London, in 1854, the proportion of Jews to Christians among the out-patients was nearly one to three; yet the ratio of cases of syphilis in the former to those in the latter was only one to fifteen; and that this difference was not due to their superior chastity was evident from the fact that the Jews furnished nearly half the cases of gonorrhœa that were treated during the same period. Mr. Hutchinson's observations also lead him to believe that hereditary syphilis is much rarer among the children of Jews than Christians; and the experience of most surgeons will confirm the fact that persons with a long prepuce, and especially those affected with congenital phymosis, are peculiarly subject to venereal diseases.

[1] Medical Times and Gazette, Dec. 1, 1855.

The size of the preputial orifice in congenital phymosis varies in different cases. In some, it is large enough to permit of the partial exposure of the glans and the removal of the natural secretion of the part, at least with the assistance of a syringe and injections of warm water; while in others, it is so contracted that it is difficult or even impossible to uncover the meatus; whence it happens that the entrance of the urine at each act of micturition beneath the prepuce, and the collection of sebaceous matter, maintain a constant state of irritation and even chronic inflammation, to which most of the adhesions met with between the opposed surfaces are undoubtedly attributable.

Daily observation proves that congenital phymosis is not inconsistent with a state of perfect health; and yet when we reflect upon the sympathy existing between different portions of the genito-urinary apparatus, and between the latter and other organs, we might reasonably expect to meet with at least occasional instances in which irritation of the head of the penis due to this cause gives rise to disturbance in other parts of the body. These anticipations are realized in practice; but, according to Fleury,[1] who has ably investigated this subject, such disturbance is to be attributed more to the extreme sensitiveness of the balano-preputial membrane constantly protected from friction and exposure to the air, than to the irritation of collections of sebaceous matter; since it is often present even when the condition of the parts admits of the most perfect cleanliness.

Among the symptoms which have been ascribed to congenital phymosis are: balanitis, constant itching and even pain at the head of the penis, inordinate excitability of the genital organs, frequent erections, erotic dreams, seminal emissions, imperfect development of the penis and testicles, incomplete and painful ejaculation of the sperm, vesical tenesmus, incontinence of urine, gastralgia, neuralgia, and general lassitude and prostration. Probably no one will be disposed to call in question the occasional connection between the milder of the above affections and phymosis. With regard to the others, some doubts might be legitimately entertained, were it not for the circumstantial report of the symptoms, and the fact that simple excision of the elongated prepuce has in most cases brought complete and permanent relief.[2]

[1] Gaz. des Hôp., Oct. 30, 1851.

[2] Fleury's observations have been fully confirmed by Borelli (*Maladies genito-vésicales, Gaz. des Hôp.*, Dec. 1851); Anagnostaxis relates a cure of amblyopia by the excision of the prepuce (*Rev de. Thér. Méd.-Chir.*, No. 4, 1850); and Trousseau one of incontinence of urine by the same operation (*Gaz. des Hôp.*, No. 9, 1860).

Verneuil reports a very interesting case in which careful microscopical examination of the excised prepuce showed that the terminal plexus of nerves had become hypertrophied, and in which the nervous symptoms were thus fully accounted for.[1]

Accidental phymosis may depend upon any cause enlarging the glans penis to such an extent that it will not pass through the preputial orifice, or occasioning such an amount of thickening or contraction of the prepuce that it cannot be retracted; in other words, the seat of the difficulty may be either in the glans or its covering.

In some cases the obstruction is simply mechanical, as from vegetations within the balano-preputial fold, the induration surrounding a chancre, or the cicatrization of any ulcer situated upon the margin of the prepuce.

More frequently it originates in inflammatory action, as idiopathic balanitis or posthitis, or the same affections excited by the presence of ulcers, secondary eruptions, vegetations, etc., either of which may occasion swelling of the glans or infiltration in the lax cellular tissue of the prepuce.

There is still another cause of phymosis which, strictly speaking, cannot be included among those just mentioned; I refer to a peculiar thickening of the mucous membrane and submucous tissue, observed both in men and women after the cicatrization of a chancroid or chancre, and which consists neither in specific induration nor œdema, but in hypertrophy of the normal tissues of the organ. Gosselin believes that this effect is peculiar to venereal ulcers. It is most frequently found in the labia minora in women, and in the prepuce in men. In the latter the envelope of the glans may become so thickened that its retraction may be very difficult and give rise to fissures of the preputial orifice, or may be quite impossible.

Treatment.—In congenital phymosis attended by any of the unpleasant effects alluded to at the commencement of this chapter, circumcision is the only sure means of relief; but if, from any cause, an operation be impracticable, the patient should be directed at each act of micturition to expose the meatus as perfectly as possible in order to prevent the retention of the urine beneath the prepuce.

In accidental phymosis, the rule is to avoid an operation if possible, unless congenital phymosis has previously existed; but when

[1] Archives Générales de Méd., Nov., 1861.

due to vegetations beneath the prepuce, or to contraction of the preputial orifice from the cicatrix of a chancroid *which has entirely healed*, an operation may be necessary to gain access to the abnormal growths or to restore the opening of the prepuce to its original size.

Phymosis dependent upon a large mass of specific induration, of which I have met with several instances, disappears under the internal administration of mercurials.

An operation should, if possible, be avoided or deferred when the phymosis is due to acute inflammation, which may in most cases be subdued by rest in the horizontal posture, low diet, cathartics, leeches to the groin or perineum (not upon the prepuce), a lead and opium wash, and, if it be certain that no chancroid is present, by scarifications; but if gangrene threaten, delay is no longer justifiable.[1]

In some instances, we are certain that an ulcer is concealed between the prepuce and glans, where it may have been seen either by the patient or surgeon before the phymosis supervened; in others, its existence is highly probable, from the fact that the patient has been exposed in promiscuous intercourse. Now the mere suspicion of an ulcer within the hidden folds of mucous membrane is sufficient to induce great caution in resorting to an operation which may be followed by inoculation of the edges of the wound. It is indeed true that if the sore be a chancre, auto-inoculation will not be likely to take place; but it may be of the mixed variety, or there may be both a true chancre and a chancroid; hence the fact that a mass of induration can be felt beneath the prepuce is not sufficient of itself to justify an operation. A case in point has fallen under my own observation: A medical friend was called to treat a case of phymosis dependent upon an ulcer, surrounded by a cartilaginous mass of induration which could be felt beneath the prepuce. Relying upon the fact that a chancre cannot be inoculated upon the person bearing it, he resorted to an operation; in a few days the edges of the wound assumed the appearance of a chancroid. The original ulcer was undoubtedly of the mixed variety.

Under some circumstances, however, and especially with gangrene threatening, an operation cannot be avoided, and the prepuce should be slit up by means of a curved bistoury carried along a director, which has been introduced from the orifice to the angle of reflection; but the incisions should be carefully protected from contact with the virus, and, if inoculated, should be cauterized with nitric acid.

[1] This point will be farther discussed in the chapter on the chancroid.

The thickening of the substance of the prepuce, already described as a sequela of venereal ulcers, is rarely so great as to produce complete phymosis; but the difficulty attending the exposure of the glans and the frequent rents which the act occasions, often justify the removal of the hypertrophied tissues.

Circumcision.—Partial operations for phymosis, as, for instance, slitting up the prepuce along the dorsum, or excision of a triangular portion, often fail to afford permanent relief, and leave the organ in a misshapen condition. The purposes of elegance and utility can best be subserved by circumcision.

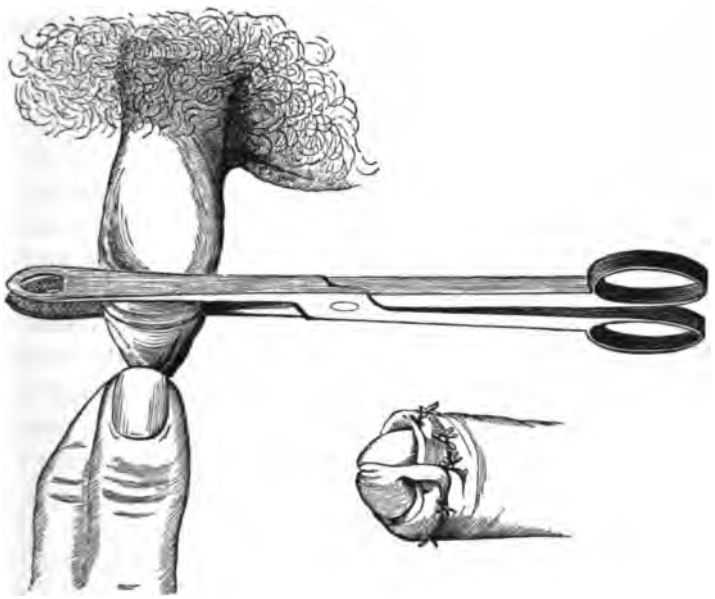
Before describing this operation, let me remind the student that the prepuce is composed of two layers, separated by cellular tissue of such lax texture as to admit of an almost indefinite amount of motion between them. The internal or mucous layer is firmly attached to the penis posterior to the corona glandis, and hence is incapable of being drawn forwards to any great extent in front of the glans. The external or integumental layer, on the contrary, is continuous with the flaccid skin of the body of the penis, and may be elongated almost indefinitely; its anterior portion doubling in upon itself as the posterior is drawn forwards. It follows from this anatomical arrangement, that a section of the prepuce in front of the glans can only include the integumental together with an insignificant portion of the mucous layer.

Of the various methods of performing circumcision recommended by different authors, I prefer the following:—

The patient should be upon the bed where he is to lie until cicatrization is accomplished, in order after the operation to avoid unnecessary motion and hemorrhage, which would interfere with speedy union; and if he is incapable of self control, he should be etherized. The requisite instruments are a pair of long-bladed forceps, a sharp-pointed bistoury, blunt-pointed scissors, and sutures of iron or silver wire, or *serres-fines.*

Allow the penis to hang without traction in its natural condition, and with a pen and ink trace a line upon the skin corresponding to the corona glandis, to serve as a guide for the incision. Next draw the prepuce forwards, until this line is in front of the glans, and grasp it between the long blades of the forceps (somewhat more obliquely than is represented in the adjoining cut, so as to include a larger portion of the prepuce above than below), which should be intrusted to an assistant; the external part is now to be excised in front of, and close to the blades of the forceps, having first been put upon the stretch by the left hand of the operator. Any attempt to

Fig. 2.



(After PHILLIPS.)

cut from either margin of the fold will be attended with some difficulty, since the several layers of the skin and mucous membrane oppose an amount of resistance to the knife that is not readily overcome; hence, it is better to transfix the centre of the flap (the blade of the knife parallel to, in front of, and in contact with the forceps), cut downwards, and complete the section by turning the knife, and cutting upwards.

The assistant should now remove the forceps, when the integument will retract, carrying its cut edge back to the base of the glans, and exposing the raw external surface of the mucous membrane which still covers the glans. If the mucous membrane be in a healthy condition, it may be divided with scissors along the dorsum, and turned back to be united to the integument; but if thickened by chronic inflammation, vegetations, or the cicatrix of an ulcer, more or less of it should be excised. The parts should not be brought into coaptation until the bleeding has been arrested by exposure to the air, and torsion of the small vessels. Union may be effected by means of sutures of iron wire, or serres-fines, which should be removed as soon as the edges of the wound are securely glued together with lymph, or within twenty-four or forty-eight

hours. I prefer simple exposure to the air, and protection by means of a cradle from contact with the bedclothes, to the water-dressing commonly employed, unless union by first intention fails to take place, and suppuration ensues. The patient should remain in bed until the parts have entirely healed, and, if the contact of the urine with the wound cannot be otherwise prevented, should micturate with his penis immersed in a basin of tepid water. In favorable cases, confinement to the house for two or three days is sufficient.

It would hardly seem necessary to caution the surgeon not to excise too large a portion of the integument, were it not for the following case reported by Nélaton:[1] A patient appeared at the clinique who had been operated upon for phymosis eleven days before by the usual method. The physician, forgetting that the integument of the penis is very lax and extensible, had, before making the incision, drawn it forwards to its utmost limits; the consequence was that, after the operation, the penis was denuded nearly to the abdominal wall. An extensive suppurating surface had remained, which was torn and made to bleed by frequent erections. The case does not appear to have been followed to its termination, but Nélaton remarks upon the rigidity and malformation of the organ, provided cicatrization should take place, and adds that "this case shows the importance of marking the limits of the incision before the operation."

The American editor of Erichsen's Surgery states that the favorite operation for phymosis at the Pennsylvania Hospital, Philadelphia, consists in simple division of the mucous layer of the prepuce, by means of fine scissors, one blade of which is sharp, and the other probe-pointed. The former is made to penetrate between the two layers of the prepuce along the dorsum of the organ, while the latter passes between the glans and its envelope, and thus the internal layer may be divided as far as the corona glandis. The prepuce should be retracted several times each day, especially during micturition, both in order to prevent contact of the urine with the wound, and also immediate union, which would thwart the purpose of the operation.

Faure accomplishes the division of the mucous layer in a simpler manner, as follows: The skin of the penis is forcibly drawn towards the abdomen, when an incision is to be made with blunt-pointed scissors upon the dorsum of the retracted preputial orifice, implicating the mucous membrane, but sparing the integument. This allows of a still farther retraction of the prepuce, bringing into

[1] Pathologie Chirurgicale, t. v., p. 663.

view an additional portion of mucous membrane, which, by a succession of the above procedures, may be divided to the base of the glans.

Jobert (de Lamballe) makes an incision from the preputial orifice on each side of the frænum as far as the corona glandis; then cuts off the frænum, which is now included in a small triangular flap; and finally unites the skin and mucous membrane by the interrupted suture, thus leaving the greater portion of the prepuce intact and merely enlarging its orifice beneath.[1]

These methods, unattended by any loss of substance, may suffice when it is desired simply to relieve uncomplicated phymosis; but when the mucous membrane is in a diseased condition, as is generally the case when an operation is required, circumcision should be preferred.

[1] Gaz. des Hôp., Aug. 27, 1861.

CHAPTER V.

PARAPHYMOSIS.

In paraphymosis the extremity of the penis is strangulated by a narrow preputial orifice retracted behind the prominent corona glandis, which forms the chief obstacle to reduction. After the lapse of a few hours or days, the parts behind and especially in front of the stricture become swollen from infiltration of serum and fibrine; the constricting ring is concealed in a deep furrow between them, and is still farther retained in its abnormal position by adhesion to the deeper textures—the result of inflammatory action. Ulceration or gangrene may finally supervene, and perhaps relieve the stricture, but with an unnecessary loss of tissue.

Paraphymosis is frequently met with in boys, as the result of their first attempt to expose the glans. It may also follow the injudicious retraction of the prepuce when previously affected with phymosis, and while the parts are still in an inflamed condition.

Treatment.—When called to a case of paraphymosis, it may not be advisable to attempt reduction until the œdema has first been diminished by rest in the horizontal posture, elevation of the penis, and a saline cathartic, assisted in some cases by scarification of the swollen tissues in front of the stricture, the application of ice or a stream of cold water directed upon the part.

Reduction may often be facilitated by placing the patient under the influence of an anæsthetic. The difficulty is frequently increased by the vicious manner in which the attempt is made. The swollen glans and mucous layer of the prepuce are to be passed through a narrow preputial orifice. Mere pressure from before backwards will increase their transverse diameter and augment the difficulty of reduction; this can be best accomplished by compressing, and, if necessary, elongating them, and drawing the constricting ring and integumental layer over them.

To effect this purpose, let the parts in front of the stricture be well-oiled, and the glans enveloped in a thin rag, that it may afford

a firmer hold to the fingers. The surgeon steadily compresses the glans for ten or fifteen minutes in its transverse diameter, with the thumb and fingers of his right hand, and endeavors to relieve its distended vessels of a portion of their contents. He then encircles the body of the penis with the thumb and fingers of his left hand, and draws the integument forwards, attempting at the same time to insert the right thumb nail beneath the stricture, and elevate it above the corona glandis, which is most prominent upon its superior aspect.

Fig. 3.

(After PHILLIPS.

Steady perseverance in the above method will rarely fail of success, when reduction is possible; but the following modes, recommended by different authors, are perhaps worthy of description.

In an ingenious method proposed by M. Garcia Térésa, the centre of a piece of tape is placed upon the dorsum of the corona glandis, the opposite ends passed round the sides of the glans, crossed beneath the frænum, and wound around the little finger of each hand; the glans is then compressed by flexing the middle and ring fingers, and exercising traction in opposite directions, while the other fingers remain free to draw the prepuce forwards, and accomplish its reduction.[1]

Dr. Van Dommelen effects compression of the glans by winding around it a strip of adhesive plaster half a yard long, and about a quarter of an inch wide, commencing at its base, and terminating near the orifice of the urethra.[2]

M. Seutin, of Brussels, has invented a pair of forceps with spoon-shaped extremities, to maintain compression of the glans until the constricting ring can be drawn over them.

The three preceding methods are designed for the purpose of compressing the glans during reduction; in the following, which is said to be employed with great success at the Children's Hospital, in Pesth, compression of nearly the whole organ precedes the attempt to restore the preputial orifice to its normal position:—

The penis is first well cleansed and dried, when a strip of adhesive

[1] Rev. de Thér. Méd.-Chir., Feb. 15, 1860.

[2] Med. Times and Gaz., June 4, 1859.

plaster, about three lines broad, is applied longitudinally from the middle of its under surface, over the swollen prepuce and glans, avoiding the meatus, to the middle of the upper surface. Another strip is carried in a similar manner from side to side over the glans, and in large boys a third, and even a fourth strip, may be required to cover the whole organ. Finally, still another strip is firmly applied transversely over the preceding, commencing just behind the meatus, and continued by successive turns to the middle of the body of the penis. The application is said to be well borne, and the swelling so diminished within twenty-four hours, that the plaster must be renewed; reduction can usually be effected within forty-eight hours.

The late Abraham Colles, Prof. of Surgery at the Royal College of Surgeons in Ireland, succeeded, after other means had failed, in relieving two severe cases of paraphymosis, by passing a director beneath the stricture from before backwards, and elevating it upon the point of the instrument, while the stem was made to compress the swelling in front, and gradually force it back beneath the stricture. This process was repeated on each side of the penis, after which reduction was quite easy.[2]

When reduction is impossible, and ulceration or gangrene threatens, it becomes necessary to relieve the stricture, by dividing the preputial ring, which—as should not be forgotten—is situated at the base of the furrow between the swollen folds of mucous membrane and integument. This may be done by entering a narrow, sharp-pointed bistoury flatwise, and from before backwards, upon the dorsum of the penis, turning its edge upwards, and dividing the stricture. In some cases, this procedure must be repeated in several places, and the swollen prepuce freely scarified, before reduction can be effected.

[1] SCHMIDT's Jahrbücher.

[2] Dublin Quart. Journ. of Med. Sci., May, 1857

CHAPTER VI.

SWELLED TESTICLE.

THE most frequent complication of gonorrhœa is an affection of the scrotal organs, variously known by the names of swelled testicle, hernia humoralis, orchitis, and by the more correct term, *gonorrhœal epididymitis*. In order to understand the mode in which this complication supervenes upon gonorrhœa, it is desirable to recall to mind the canal which connects the testicle and the urethra, and which is designed for the passage of the seminal fluid. Tracing this canal from before backwards, we have first the aperture of the ejaculatory duct, near the anterior extremity of the veru montanum in the prostatic portion of the urethra; following this duct, we find that it merges into the vas deferens, which passes round the bladder, through the spermatic canal in the abdominal muscles, and finally descends within the scrotum, where it terminates in the numerous and intricate convolutions of the epididymis. We thus have a passage, lined with mucous membrane, which is continuous with the mucous membrane of the urethra, and connects the deepest portion of this canal with the epididymis.

In the early stages of urethral gonorrhœa, the inflammation is generally confined to the neighborhood of the fossa navicularis. At a later period, however, the deeper portions of the canal are involved, and the disease thus gains access to the ejaculatory duct, and, under the influence of any exciting cause, may extend along the spermatic canal to the epididymis, or even beyond this, to the testicle and the tissues which envelope it. The patient's own sensations will sometimes indicate that in this mode has originated the affection of the testicle. He has felt a dull pain in the perineum and in the groin, along the course of the spermatic vessels, for a day or two before he observed the tenderness and swelling of the testis. Again, we may find additional evidence in the fact that the cord corresponding to the inflamed testicle can be felt externally to be swollen and hard, and can be traced from the testicle through the inguinal canal, even into the iliac fossa. Post-mortem exam-

nations, also, have exhibited the ordinary appearances of inflammatory action throughout the whole of the canal connecting the testicle and urethra. There can be but little doubt, therefore, that in many, and probably in most cases, swelled testicle owes its origin to the extension of the inflammation along a continuous mucous surface.

In some cases, however, no evidence of such extension can be found either in the sensations of the patient, or in any abnormal condition of the cord, which appears to be entirely unaffected. These cases are analogous to the inflammation of a lymphatic ganglion in the groin or axilla, in consequence of a wound of the foot or hand; the lymphatic vessel connecting the two exhibiting no symptoms of inflammation. It may be that the inflammation has traversed this vessel, but that its passage has been so rapid as not to excite notice, and to leave no traces behind it; or it may be that particles of irritant matter have been conveyed along the duct, and lodged in the ganglion. A similar explanation is given in cases of swelled testicle without appreciable lesion of the cord, by those who refuse to admit any other origin for this disease than the direct extension of the inflammatory process. Most authorities, however, admit that swelled testicle may be excited through sympathy alone, without any inflammation, however slight, of the spermatic tract, or any passage of irritant matter; and the subsidence of the swelling in one testicle, and its subsequent appearance in the other, as is observed in some cases, renders this view probable.

CAUSES.—Gonorrhœa of the urethra is the only form of gonorrhœa which gives rise to swelled testicle, which is never met with as a complication of balanitis.

The following table, drawn up by M. de Castelnau,[1] exhibits the times of its appearance in the course of the gonorrhœa, in 239 cases, collected from different sources:—

	Gaussail.	Despine.	Aubert.	De Castelnau.	Total.
1st week . . .	3	2	8	3	16
2d " . . .	4	6	17	7	34
3d " . . .	5	2	9	8	24
4th " . . .	16	2	15	6	39
5th " . . .	39	2	8	5	54
6th " and later .	6	15	43	8	72
Total, . .	73	29	100	37	239

[1] Annales des Maladies de la Peau et de la Syphilis, May, 1844.

In the experience of most surgeons, swelled testicle is even rarer during the first fortnight of a gonorrhœa, than would appear from the above statistics. As a general rule, it may be said to supervene after the third week, and most frequently after the sixth week.

Cases are reported in which it has occurred after the discharge had entirely disappeared, and in one as late as three months. A patient once came to me with swelled testicle, five weeks after I had treated him for a clap, and had dismissed him as cured, and he assured me that he had not perceived any discharge in the meanwhile, nor could I discover any upon examining the penis. It is probable, as stated by Velpeau, that in these cases there still remains, in the prostatic portion of the urethra or at the neck of the bladder, a small amount of inflammation, but not sufficient to manifest itself externally.

Instances are recorded in which the swelling of the testicle is said to have appeared before the discharge from the urethra. In one case reported by M. Castelnau, the epididymitis was developed a week after coitus, and the urethral running was first seen five days afterwards. M. Vidal (*Ann. de Chir.*, 1844) gives a similar case, and Velpeau (*Dict. de Méd.*, art. *Testicule*) admits such an occurrence. It is not improbable that a gonorrhœa really existed, but was overlooked, in these cases; still it is possible that the prostatic portion of the urethra alone received the irritation from coitus, and that the effect produced was insufficient to manifest itself by a discharge until after the swelling of the testicle had taken place.

In some instances we are able to trace an attack of swelled testicle directly to some exciting cause, which has aggravated the urethral disease. Thus the patient may have been imprudent in exercising or in exposing himself to cold, or he may have indulged in a debauch or in sexual intercourse. Strongly irritant injections, or any violence done to the canal by a large bougie, or by forcible distention when using a syringe, may also occasion it. One of the most severe cases of this disease that I ever met with had been induced by the forcible introduction of a large bougie in the treatment of a gleet of several years' duration. In other instances, however, the exciting cause of epididymitis is not apparent, independently of the fact that the inflammatory action has had time to involve the prostatic portion of the urethra and gain access to the spermatic ducts. It has been supposed by some surgeons, that the use of copaiba and cubebs is occasionally the cause of epididymitis; while others have not only denied this, but have even recommended these drugs in the treatment of this affection. I have already

referred to this subject in speaking of the anti-blennorrhagics, and will only say at present that evidence is wanting in favor of both these assertions. We have no reason to believe that copaiba and cubebs ever occasion this disease, and still less reason to believe that they can be used with benefit in its treatment.

It should not be forgotten that wearing a well-fitting suspensory bandage during an attack of gonorrhœa is the best protection against swelled testicle. The patient is thus relieved of the weight of the scrotal organs, the flow of blood from the part is facilitated, and the liability to inflammatory action is consequently much diminished.

SEAT.—Gonorrhœal epididymitis more frequently attacks the left testicle than the right. Of 1342 cases observed by Prof. Sigmund, of Vienna, the left testicle was affected in two-thirds.[1] The greater frequency of this disease on the left side has been attributed by some authors to the fact that men usually "dress" on this side, and that the left testicle consequently receives less support than the right. This explanation, however, is very questionable. The difference is doubtless to be found in that cause, as yet not explained in a perfectly satisfactory manner, which renders the left testicle more prone than the right to take on various forms of morbid action. Both testicles rarely become inflamed simultaneously, but not unfrequently one is attacked after the other. This usually occurs only after the lapse of several weeks, though I have seen the two attacks separated by only a few days' interval. Sigmund states that both testicles were affected in seven per cent. of his hospital patients, and in five per cent. of his private cases. Occasionally, the inflammation, after leaving one testicle and attacking the other, will return to the first; to this form of the disease Ricord has given the expressive name of *see-saw* epididymitis.

The best authorities, with but few exceptions, agree in the statement that it is the epididymis, of all the scrotal organs, which is first and chiefly involved in most cases of this disease. It is here that the vas deferens terminates, and we may suppose that the inflammatory action is retarded in its progress by the innumerable and intricate convolutions which compose this appendage to the testicle. At an early stage of the inflammation, and also after the swelling

[1] British and Foreign Medico-Chirurgical Review, Oct. 1856.

Mr. Curling denies that the left testicle is most frequently affected (Diseases of the Testis, p. 226), but his statement is founded on 138 cases only, which are far inferior in number to the above statistics of Prof. Sigmund.

has somewhat subsided, the epididymis can be felt enlarged to several times its natural size. The normal position of the epididymis is posterior and external to the body of the testicle, and pressure upon this part excites more pain than elsewhere. The epididymis, not being enveloped, like the testicle, in a fibrous capsule, is susceptible of an indefinite amount of tumefaction, and frequently enlarges to such an extent as to partially surround and encase the body of the testis.

It should be recollected, however, that the position of the epididymis, relative to the testicle, may be abnormal; in which case the seat of the greatest tenderness and swelling will differ from the description just now given. Such malpositions are called by the French *inversions du testicule.* They have recently been thoroughly investigated for the first time by M. Eugène Royet,[1] who admits the five following varieties:—

1. The epididymis may be anterior to the body of the testicle.
2. It may be on one side, either the external or internal.
3. It may be superior; the long axis of the testis being antero-posterior, and the epididymis resting upon its upper surface.
4. In the fourth variety, the epididymis and vas deferens form a loop or sling, which surrounds the testis from before backwards.
5. In the fifth variety, the relative position of the epididymis and testis varies from day to day, without appreciable cause.

All these varieties are rare, with the exception of the first, which, according to Royet's researches, is met with in one out of every fifteen or twenty persons. The abnormal position of the epididymis in front of the testicle is, therefore, the only one possessing much practical importance. The possibility of this malposition should be borne in mind both in operating for hydrocele and when forming a diagnosis of scrotal tumors. In cases of epididymitis, when the inflammation is not general, the epididymis may be recognized by its hardness to the touch and its sensibility to pressure. When all the scrotal organs are involved in the inflammatory process, Royet states that the chief means of recognizing an anterior position of the epididymis, are a want of mobility in the skin anteriorly, owing to its adhesion at this point to the epididymis and the fact that the vas deferens can be felt in front, instead of behind the other vessels of the cord.

Next to the epididymis, the tunica vaginalis is most frequently involved in gonorrhœal epididymitis. M. Rochoux has advanced the idea that inflammation of this membrane is the chief and con-

[1] De l'Inversion du Testicule; Paris, 1859, p. 55.

stant lesion in swelled testicle;[1] but this is a mistake. Vaginalitis, although a very frequent, is not a constant symptom, and is always consecutive to the inflammation of the epididymis. There is commonly an effusion varying in quantity and character, within the tunica vaginalis. This may consist only of serum and be apparently due to simple obstruction of the circulation; or it may contain fibrin and other products of inflammation. Sometimes bands of lymph bind the two opposed surfaces together, as in pleurisy. The sub-scrotal cellular tissue also participates in the inflammatory action, and is thickened by œdema or fibrinous deposit. The frequency with which the tunica vaginalis is involved in swelled testicle, while the body of the testicle is unaffected, has been explained by Gendrin,[2] who states that when the cellular tissue of an organ is continuous with that underlying a neighboring serous membrane, it becomes a ready means of communicating inflammatory action; but when a contiguous organ is not thus connected with the original seat of the disease, the passage of the inflammation is less easy. The connecting link between the epididymis and tunica vaginalis is found in the areolar tissue which penetrates the former and underlies the latter, while the testicle is surrounded by the fibrous tunica albuginea, and, being thus isolated, generally escapes.

Following the tunica vaginalis in the order of frequency, the spermatic cord is next found to be the seat of inflammatory action in gonorrhœal epididymitis. The body of the testicle is rarely affected; and even when involved, the fibrous tunic which invests it limits the amount of swelling of which it is capable, although it greatly increases the suffering of the patient by constricting the inflamed tissues.

Some idea of the comparative frequency with which the different tissues now mentioned are attacked in this disease may be formed from the statistics of Prof. Sigmund, already referred to. In 1342 cases, the epididymis was alone affected in 61; the epididymis and tunica vaginalis in 856; the epididymis and cord in 108, and these three parts together in 317.

The propriety of the name, gonorrhœal epididymitis, will now be evident. It is no objection to this term that the epididymis, in many cases, is not the only part involved. As in diseases of the eye, we call a certain inflammation iritis, though other parts besides the iris are involved, so in swelled testicle, the principal seat of the

[1] Du Siège et de la Nature de la Maladie improprement appellée Orchite Blennorrhagique, Arch. Gén. de Méd., 2e série, 1833, t. ii, p. 51.

[2] Histoire Anatomique des Inflammations, t. i. p. 143.

disease should determine its scientific name. The term orchitis, which is adopted by Vidal, Velpeau, and most English authors, is less correct, and is moreover objectionable, because it is calculated to confound this disease with that affection of the testicle which is produced by syphilis, and which is totally distinct in its character and symptoms.

SYMPTOMS.—There are generally no marked premonitory symptoms preceding an attack of swelled testicle. Sometimes, however, we find that the patient has suffered from malaise for several days; that he has had slight fever, perhaps a chill, and a dull pain or heavy sensation in the perineum, cord, and scrotal organs, attended with a frequent desire to pass water. His attention is soon attracted to the testicle by pain, felt especially on motion, and on examination he finds this organ swollen, and tender on pressure. The swelling and tenderness rapidly increase, and the pain extends to the corresponding thigh, to the groin, and to the lumbar region. In the course of twenty-four or forty-eight hours, the affected side of the scrotum may have attained the size of the fist; the skin is tense and in some cases of a dark red or almost purplish hue; the pain is very severe, especially at night, preventing sleep; the least pressure upon the part, even from the bedclothes, is almost unendurable; partial ease only can be attained by keeping perfectly quiet in the horizontal posture with the addition of some support to the genital organs. If the cord be involved, the pain, swelling, and tenderness are found to extend upwards to the inguinal canal. There is generally more or less febrile disturbance of the system at large. The skin is hot, the tongue coated, the pulse increased in force and frequency, and the patient extremely nervous and agitated. Cases are reported in which the swelling of the cord was so excessive as to produce strangulation at the abdominal ring, attended by symptoms resembling those of strangulated hernia, such as abdominal tenderness and vomiting. It must not be supposed, however, that the symptoms are always so severe as those now described. Such severity is more apt to be met with in persons of a nervous temperament, in whom this disease is one of the most distressing that can occur. In other cases, however, the suffering is comparatively slight, and I have known patients to attend to their daily occupation during its whole course. Between these two extremes we may have every shade of variation.

While the inflammation is at its height it is impossible to distinguish the different portions of the scrotal organs. Judging from

mere inspection of the swelling, we might be led to suppose that it was chiefly made up of the body of the testicle. This, however, is not so. It is composed, for the most part, of the swollen epididymis, of an effusion into the tunica vaginalis, and of œdema of the subscrotal cellular tissue. The hydrocele is often, but not always, sufficient to enable us to detect distinct fluctuation, and rarely, if ever, is the tumor transparent; but on gently touching it, the surface is found to yield for a short distance before the fingers come in contact with the firmer body of the testicle beneath. This yielding is due to the displacement of the œdema of the scrotum and of the fluid in the sac. If the tumor be punctured with a lancet, bloody serum, varying in amount from a few drops to several drachms, will escape.

Resolution begins to take place in a few days, commencing in the anterior portion of the tumor. The œdema of the scrotum and the hydrocele disappear, and the different portions of the testis can now be distinguished from each other—the epididymis, still swollen and hard, behind; and the body of the testicle, preserving, in most cases, its normal elasticity, in front. The whole duration of the attack varies from one to three weeks. In a discussion on the treatment of this disease before the Academy of Medicine in Paris, in 1854, Velpeau stated that its duration under ordinary methods of treatment averaged 16 to 18 days.

In some cases of swelled testicle, after the more acute symptoms have subsided, the parts still remain engorged and the disease shows a tendency to become chronic. This is most likely to occur in patients of weak habit, and while this condition lasts the least exciting cause may induce a return of the acute inflammation.

Most cases of swelled testicle terminate favorably. In some rare instances, however, abscesses form in the cellular tissue underlying the scrotum, or in the epididymis or body of the testicle. Mr. Edwards[1] has recently reported a case in which the whole testicle protruded through an opening formed by an abscess in the scrotum, the skin being drawn in around the orifice. Mr. Edwards "pared the edges, drew them asunder, making with the handle of the scalpel a sufficient separation of the deeper tissues, and the testicle was at once drawn, as it were, back into the scrotum, the wound closing over it. Three hare-lip pins were inserted; the wound closed by first intention, and the patient was walking about perfectly well on the seventh day." If an abscess form and be not early evacuated, the pus generally burrows in various directions,

[1] Edinb. Med. Journal, Nov., 1860, p. 455.

forming sinuses, and destroying a portion of the parenchyma, but the loss of a portion of the organ does not appear to be followed by any disturbance of its function; sometimes a circumscribed abscess is formed, which may become encysted, and, the more fluid portion being absorbed, the solid portion may remain in a concrete state for an indefinite length of time, and closely resemble a tubercular deposit. The presence of the cyst will clear up the diagnosis, since true tubercular matter is always found in direct contact with the parenchyma of the testis, and is never encysted.

The swelling of the testicle attendant upon gonorrhœa may, however, be the exciting cause of true tubercular deposit, in persons of a strumous diathesis.[1]

As the epididymis was the first part attacked, so it is the last to recover its normal condition, and in some cases it retains, for months or years, an irregular and knotty mass of induration, which may obstruct the passage of the semen and render the affected testis useless. If this induration exist on both sides, or if the opposite testicle be undeveloped, as is often the case with an undescended testis, the patient will probably be impotent. In a few rare cases gonorrhœal epididymitis has been known to terminate in atrophy of the testicle. Hypertrophy is extremely rare, but is sometimes seen in persons who have had frequent attacks of swelled testicle.

The condition of the urethral discharge preceding and during an attack of swelled testicle has been the subject of considerable discussion. It was at one time supposed that this complication of gonorrhœa was usually preceded by a diminution of the running, and hence that it might be attributed to the use of active measures which were supposed to drive the disease from the urethra to the testicle. On this supposition has been founded the theory that swelled testicle may be caused by metastasis. A proper appreciation of the facts in the case, however, does not warrant this conclusion. It is, indeed, true as a general rule, that the urethritis has passed the acute stage, and that the discharge has consequently diminished before the epididymis becomes inflamed,[2] but this is the natural

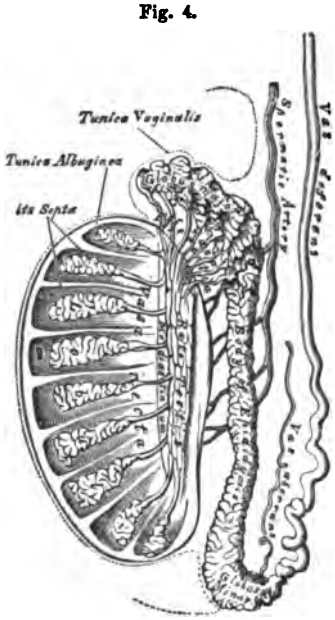
[1] A case of this kind was recently exhibited at a meeting of the Anatomical Society of Paris. Bulletin de la Soc. Anat. de Paris, 2d série, t. iv., p. 2.

[2] Gaussail's statistics relative to the discharge are as follows: In 67 of 73 cases, the discharge and the other symptoms of the gonorrhœa had diminished more or less—in other words, the acute stage of clap had passed—when the swelling of the testicle took place; in 6 cases, the gonorrhœa was still at its height.

In 30 of the 73 cases, the discharge gradually diminished and disappeared entirely during the treatment of the epididymitis; in 43 cases, some discharge remained after the disease of the testicle was cured.

course of the disease when no complication whatever takes place. To prove a metastatic origin of the epididymitis, it would be necessary to show that there is a sudden disappearance or diminution of the running, just preceding the swelling of the testicle; such, however, does not occur. On the contrary, as stated by Ricord, there is often an exacerbation of the urethral disease and a slight increase of the discharge for a day or two preceding. When the disease of the testicle is fairly established, the discharge diminishes as a consequence of revulsive action. These phenomena coincide with what is seen in affections of other parts when acute inflammation is established in their neighborhood.

Fig. 4.



Vertical section of the testis and epididymis. (After GRAY.)

The induration of the epididymis, which frequently remains for some time after an attack of swelled testicle, or which may even become permanent, requires further mention. This induration is commonly situated in the lower part of the epididymis, in or near the globus minor. It will be recollected that the upper portion, or globus major, is composed of the convolutions of the vasa efferentia, which are from ten to thirty in number, but that these minute vessels unite into a single duct, before leaving this portion. Hence the globus major of the epididymis consists of several seminiferous tubes, any one of which would be sufficient to convey the semen, in case the others were obstructed; while the body and globus minor contain but one tube, the obliteration of which must completely cut off the communication between the testis and the penis. But it is in this latter portion, viz., the globus minor, that the induration left by an attack of swelled testicle is almost invariably found; and, as we shall presently see, it generally effects the obliteration of the single duct of the part, and renders the patient impotent upon the affected side.

It now becomes an interesting subject of inquiry, what effect this obliteration has upon the testis, whether it becomes atrophied, or whether it remains in a normal condition, and continues to secrete sperm. Again, in those cases in which epididymitis has occurred

on both sides, an induration may be left in each testicle, totally obstructing the passage of semen; in such cases does the patient still retain sexual desires; is he capable of sexual intercourse; and if so, how does his semen differ from that of a perfectly healthy individual? These questions have been ably answered in a paper by Dr. L. Gosselin, published in the *Archives Générales de Médicine*, for Sept. 1853.

Dr. Gosselin's conclusions are based upon experiments upon the lower animals, and upon the observation of nineteen patients affected with double induration of the epididymis following gonorrhœa. The spermatic cord of one side was exposed in two dogs, the vas deferens isolated from the spermatic vessels, and a portion of it excised. The animals were killed several months after, when it was found that the testicle of the side operated on presented the same volume, color, and general character as that of the opposite side; the only difference was that the convolutions of the epididymis in the former were distended with fluid, containing a multitude of spermatozoa. The excision of a portion of the vas deferens had completely cut off the communication with the penis. These experiments proved that isolation of the testicle in the lower animals does not produce atrophy of this organ, which remains in an apparently healthy condition, and continues to secrete semen.

The nineteen persons who had had double epididymitis were met with at the Hôpital du Midi, and in the private practice of Dr. Gosselin. The time which had elapsed since the formation of the induration, at the time of the observation, varied from a few weeks to ten years. The symptoms which they presented were in some respects singular and remarkable. In all of them there was a mass of induration in the lower portion of the epididymis of each testicle. In none of them was there any apparent change in the volume of the scrotal organs, and no pain was felt at any time, not even after sexual intercourse. None of them had observed any change in their sexual desires or powers. They were all as capable of coitus as the most healthy individuals. Their erections and ejaculations were complete. Their semen was normal in quantity, in consistency, in odor, and color; it presented the chemical reactions described by Berzelius, as characteristic of sperm. Only when examined by the microscope, was it found to differ at all from healthy semen, inasmuch as *it was entirely destitute of spermatozoa.* In the recent cases, most of which were still affected with urethritis, pus and blood-globules were found mixed with the semen; in the older cases, these were absent. The

entire absence of spermatozoa in all of them was confirmed upon repeated examination by Drs. Gosselin, Robin, Verneuil, and other eminent Parisian microscopists. In two of these cases, treatment, continued in the one case for three months, and in the other for nine, resulted in the disappearance of the induration in one of the testicles, and coincidently with this resolution spermatozoa again appeared in the semen, as shown by microscopical examination.

These cases are of the highest interest, looking at them both in the light of physiology, and of pathology and therapeutics. They show, in the first place, that the quantity of fluid ejaculated is as abundant and presents the same general appearances when the canal of the vas deferens is obliterated as when it is free; also, that in case of obliteration, the secretion of sperm in the testis is not sufficient to distend the vessels to any great extent, or to occasion pain. Probably there is some absorption of the secreted sperm, but if as much of this fluid were secreted by the testicles as is commonly supposed, the effect upon the testicular vessels and upon the feelings of the patient would be more manifest. From these facts Dr. Gosselin concludes that the normal function of the testicle is to furnish the fecundating element of the sperm, viz., the spermatozoa; and that the other components of the spermatic fluid, to which it owes its color, odor and chemical reactions, and which constitute the medium in which the spermatozoa live, are derived for the most part from the vesiculæ seminales.

But the conclusions from these facts which chiefly interest us at the present time are those bearing on the pathology and treatment of epididymitis. These conclusions, as stated by Dr. Gosselin, are the following:—

1. The induration is generally situated in the globus minor of the epididymis, though it may, strictly speaking, be seated in any part of this organ Since the epididymis below the globus major is composed of but a single vessel, the obliteration of this vessel is sufficient to prevent the passage of the sperm.

2. The presence of the induration excites no pain, provided that the inflammation which produced it has entirely subsided.

3. It does not occasion any change, appreciable by the patient, in the exercise of the genital functions.

4. If the spermatic vessel be obliterated on both sides, the patient is necessarily impotent; if on one only, fecundation is possible, provided that the other testicle is sound.

5. The success of treatment in several of the cases reported

affords assurance that the power of fecundation may sometimes be restored by appropriate remedies.

M. Godard states that he has confirmed Gosselin's observations by microscopical examination of the semen of more than thirty persons affected with double chronic epididymitis; and in every instance spermatozoa were wanting.[1]

If gonorrhœal epididymitis attack a testicle which has been arrested in its descent from the abdomen to the scrotum, the nature of the case may readily be mistaken. If the testis have not left the abdominal cavity, it may simulate peritonitis or iliac abscess; if it be arrested in the spermatic canal, it may counterfeit strangulated hernia or bubo; and the liability to error is especially great, when, as often occurs, the tunica vaginalis is still connected with the abdominal cavity, and true peritonitis is set up by extension of the inflammation, attended by its usual alarming symptoms. Numerous cases in illustration of these remarks may be found in the work of M. Godard before referred to.

A still rarer abnormal position of the testicle is in the perineum; an anomaly first observed by John Hunter, who met with two cases. "Many years ago, a little boy, one of whose testicles had thus deviated from its proper course, was brought to the London Hospital. The gland was lodged in the perineum at the root of the scrotum."[2] Ricord and Vidal[3] (de Cassis) have each observed two cases; Mr. Ledwich[4] met with one in a dissecting-room subject, and Godard[5] gives the history of another, with a plate of the abnormity. These nine cases are all with which I am acquainted. A perineal testicle affected with gonorrhœal epididymitis may simulate a perineal abscess or inflammation of Cowper's glands, as in the two instances observed by Ricord.[6] "In one, there was a perineal tumor, which was exquisitely painful, fluctuating and about the size of a pigeon's egg. It was at first taken for an abscess, and Ricord was about to open it, when examination of the scrotum led to the discovery that one testicle was absent."

There is another consideration connected with abnormal position of the testicle, which is worthy of mention. In most cases of this

[1] Études sur la Monorchidie et la Cryptorchidie chez l'Homme; extrait des Mémoires de la Soc. de Biologie, année 1856, Paris, 1857, p. 105.

[2] Curling, op. cit., p. 46.

[3] Traité de Pathologie Externe, t. 5, p. 432.

[4] Dublin Quart. Journ. of Med. Sci., Feb., 1855.

[5] Op. cit., page 65, and Plate III.

[6] Godard, op. cit., p. 96.

anomaly, the gland is useless for the purposes of procreation. According to Goubaux and Follin,[1] it undergoes fibrous or fatty degeneration. This is denied by Godard, who, however, has equally shown that the gland, as a general rule, is impotent, by microscopical examination of the contained sperm after death. In eight cases out of nine, spermatozoa were wanting. Now, if the anomaly be confined to one side, and the opposite testicle be in a healthy condition, fecundation is still possible; but if the descended testicle be attacked by epididymitis, obliteration of its vas deferens will deprive the patient of all procreative power, as in the cases of double epididymitis observed by Gosselin. Godard gives the history of a man with one undescended testis, who had a child by a mistress, but who, after an attack of swelled testicle on the opposite side, was twice married without progeny, and his semen, twenty-one years afterwards, was found destitute of spermatozoa.

Pathological Anatomy.—Since epididymitis, when uncomplicated, is never fatal, opportunities for post-mortem examination are rare, and only occur in case some intercurrent disease produce the death of the patient. The most complete report of such examination with which I am acquainted, is to be found in the *Gazette des Hôpitaux*, for Dec. 21, 1854.

Case.—The patient entered Velpeau's wards at *la Charité* with swelled testicle, of eight days' duration; the epididymis was situated in front of the testicle, and was swollen and hard; the cord was also involved, while the body of the testicle appeared to be sound, and there was no effusion in the tunica vaginalis

Eighteen days after his admission, and twenty-six after the commencement of his attack, this patient died of cholera. The post-mortem was made by M. Gosselin, with the following result:—

1. The tunica vaginalis contained no fluid and was free from injection of its vessels.

2. The body of the testicle was healthy.

3. The globus major and the body of the epididymis were also healthy; but the globus minor was swollen and formed a hard, uniform mass, the size of a haricot bean. On cutting open this mass, it was found to be destitute of bloodvessels, of a uniform yellow color, resembling tubercle, and of firm consistency. The sections of the convoluted spermatic duct upon the cut surface showed that this

[1] Follin, Études Anatomiques et Pathologiques sur les Anomalies de Position et les Atrophies du Testicule; Arch. de Méd., Juillet, 1851, p. 262.

Goubaux et Follin, De la Cryptorchidie chez l'Homme et les Principaux Animaux Domestiques; Mém. de la Soc. de Bilog., 1855, p. 317.

vessel had attained three or four times its natural size, and, instead of being hollow, that *it was filled with uniform yellow matter; there was none of this matter between the convoluted vessels: it was entirely within, and in the substance of the walls.* M. Robin examined this matter under the microscope and found pus-globules, mixed with fat-globules and the granular globules of inflammation. He also confirmed the statement that this matter was limited to the interior of the vessels.

4. The vas deferens, which had recovered its normal size, was filled with yellowish matter, containing no spermatozoa, and composed of pus-globules, cylindrical epithelial cells, and granular corpuscles. Its walls exhibited a perfectly normal appearance.

5. The vesicula seminalis on the affected side was healthy. It contained a small amount of fluid, with pus-globules and epithelial cells, but no spermatozoa. Spermatozoa were found in the vesicula seminalis on the opposite side.

M. Gaussail (*Arch. Gén. de Méd.*, 1831, tom. xxvii., p. 188,) has also reported two cases of post-mortem examination of swelled testicle, in which, however, the examination was made with less care than in the case just quoted.

Mr. Curling (op. cit., p. 209) says that he has twice had the opportunity of making a post-mortem examination of swelled testicle, but gives no account of the appearances presented. Mr. Brodie[1] examined the body of a gentleman who had had gonorrhœal epididymitis twenty years before, and found the testicle smaller than natural and "one-third of the tubuli testis converted into a white substance, having the consistence, but not the fibrous structure, of ligament."

The first case which I have quoted as occurring in the service of M. Velpeau, is, I believe, the only one on record, in which the examination has been made with all the light which modern science affords, and I would especially call attention to the fact that the fibrinous deposit was found to be situated within the vessel of the epididymis and not between the convolutions. This fact is in opposition to the statement of Mr. Curling; but it can hardly be called in question in the case here reported, and it strongly favors the opinion of M. Gosselin that the communication between the testis and the penis is almost invariably obstructed during an acute attack of epididymitis, and also during the continuance of the induration which is often left behind. I would not be understood as asserting, however, that the exudation is always confined to the interior of

[1] Clinical Lecture on Diseases of the Testis; London Medical Gazette, vol. xiii., p. 219, 1834.

the vessel; it may also involve the areolar tissue connecting the convolutions, but its deposit in the former situation appears to be the more persistent, and the more important so far as the procreative powers of the patient are concerned.

The pathological changes produced by epididymitis can only be studied to advantage in recent cases. In the masses of induration which have existed for months or years, the anatomical elements are so confounded that it is impossible to distinguish them.

TREATMENT.—The treatment of gonorrhœal epididymitis should be decidedly antiphlogistic. It is indeed true that under temporizing measures, the inflammation will subside in time, but an effusion of plastic lymph, endangering the procreative powers of the patient, will be more likely to occur, than when the case is treated actively at the outset.

Rest in the horizontal posture, even if the feelings of the patient do not demand it, should be strictly insisted on. As the patient lies in bed upon his back, the scrotal organs should be supported by a number of folded towels, placed between the thighs, or by a folded handkerchief arranged around them like a sling, with its ends attached to a bandage round the waist. I usually order an emetico-cathartic, as in the following prescription:—

℞. Antimonii tartarizati gr. iv.
Magnesiæ sulphatis ℥iss.
Aquæ camphoræ ℥vj.
M.

I direct the patient to take a tablespoonful of this mixture every twenty minutes or half hour, until free vomiting has been excited, and then repeat the same quantity every few hours, or sufficiently often to keep him slightly nauseated and to produce a number of evacuations from the bowels during the day. If the case be at all severe, the application of leeches should not be omitted. It is better to apply them over the cord, directly below the external abdominal ring, rather than upon the scrotum. They thus deplete the part even more directly than in the latter situation, and any irritation from their bites is avoided. Their number should vary from four to ten, according to the severity of the case. They rarely fail to afford great relief to the pain, although the swelling may not diminish or may even increase; in some cases, however, they require to be repeated in twenty-four or forty-eight hours, or after the lapse of a few days, in case the symptoms, after once subsiding, again become aggravated. In the absence of leeches, blood may be drawn from

several of the scrotal veins. The patient should stand up, and the parts be bathed with hot water until the veins are well distended, when they may be opened with a lancet. When a sufficient quantity of blood has been drawn, the patient should again lie down and the flow of blood will usually cease in a short time; or, if excessive, it may be arrested by compression with *serres fines*, ordinary forceps, or by one of the hæmostatics.

Both cold and hot local applications have been recommended in this disease. Judging from my own experience, the former, when applied at the outset, will often succeed in arresting the progress of the inflammation; but when the disease is fairly established, the latter are more grateful to the patient and more effectual in hastening resolution. If called sufficiently early, I usually order half an ounce of muriate of ammonia to be dissolved in a pint of water, and direct the patient to keep a single thickness of cloth wet with this lotion applied to the scrotum. Simple cold water may be used in place of the solution of muriate of ammonia, although I consider the latter preferable. The bedclothes should be kept elevated, so that evaporation may be free and the temperature of the part reduced. In the course of a few hours, ice may gradually be added to the solution, with comfort and benefit to the patient, and his sensations may be taken as an index of the degree of cold required. At night, the frequent wetting of the cloths would prevent rest, and it is better, therefore, to remove them. Extract of belladonna, moistened with a little water, and smeared over the scrotum, may now take the place of the lotion, and will ease the pain and favor sleep. The internal administration of an opiate may also be required.

If cold applications are not well supported, or if, in spite of our efforts, the pain and swelling increase, poultices of bread and hot water, or linseed meal, should be substituted for the cold lotion; or in robust subjects, poultices of tobacco leaves may be employed for the purpose of obtaining the nauseating and sedative effect of this narcotic.

If at any time in the course of the treatment we have reason to suppose there is a collection of fluid in the tunica vaginalis, it is best to evacuate it. Velpeau directs, in performing this operation, that the tumor should be rendered tense by grasping it posteriorly as in the operation for hydrocele, and that the lancet, plunged into the cavity of the tunica vaginalis, should be retained in the wound, and gently twisted on its axis, in order to preserve the parallelism of the incisions in the skin and mucous membranes, until all the fluid escapes. I have not found this latter precaution necessary. When

a broad lancet is used the wound is sufficiently patent, and the parallelism of the incisions is preserved by retaining the hold on the scrotum posteriorly; indeed the fluid escapes more freely with the instrument withdrawn.

I have found the results of the above method of treatment very satisfactory. Resolution generally commences within 24 or 36 hours, and the patient is rarely confined to his room longer than five days, or a week.

When the swelling has been somewhat reduced and the pain dissipated, and the parts will bear gentle handling, resolution may be hastened by the application of strips of adhesive plaster so as to exercise compression upon the testis. This method of treatment was first suggested by Dr. Fricke, of Hamburg, and is known by his name.[1] It is not to be used until the acute symptoms have subsided, nor while the spermatic cord is much engorged, nor if there is reason to fear the formation of an abscess in the testicle or subscrotal cellular tissue. The objections which have been urged against this method have been founded upon its indiscriminate use. The feelings of the patient after the straps are applied will indicate whether they should be continued or not. If applied at the proper stage of the disease, they will afford a sensation of support and relief; should they increase the pain, they are doing harm and ought to be at once removed.

A mixture of two parts of adhesive plaster with one part of extract of belladonna spread upon thin leather, is more elegant, and, in many respects, better than adhesive plaster alone. It is softer, more elastic, less likely to chafe the skin about the cord, is removed with greater facility and ease to the patient, owing to its adhering less firmly to the skin and hairs, and, moreover, the belladonna acts powerfully as a sedative.

Before applying the plaster, the hair should be carefully removed from the scrotum with a razor or scissors. The plaster is to be cut into strips about three-quarters of an inch in width. The testicle is now to be pressed down to the lower portion of the sac and held there by the thumb and forefinger of the left hand, while a strip is placed firmly round the affected side of the scrotum, just below the abdominal ring. Successive strips are added, each one overlapping the preceding for one-third its width, and care being taken that they all fit smoothly, until all but the bottom of the testicle is enveloped;

[1] Dr. Fricke's paper was published in the Zeitschrift für die gesammte Medicin. B. j. h. l. Hamburg, 1836. A translation of it appeared in the British and Foreign Medical Review, vol. ii. 1836, p. 253.

the latter should then be covered with strips applied longitudinally, like the bottom of a wicker basket, and finally, the whole is to be secured by a long narrow strip carried circularly several times around the tumor. In the course of from twelve to twenty-four hours, the plaster will be found to be loosened by the decrease of the swelling, when it should be removed and fresh strips applied. The compression should be continued until the testis has nearly returned to its normal dimensions, and in the meantime the parts still be supported by a bandage.

When the patient can be kept quiet, strapping the testicle may commonly be dispensed with. Cullerier states that it has been entirely abandoned in France.

The application of collodion to the scrotum as a means of compression, suggested by M. Bonnafont, was a subject of discussion before the Academy of Medicine in Paris, in 1854, and a trial was made of it by Ricord and others, who reported against it.

In those cases in which, after the subsidence of the acute symptoms, the testicle remains in a condition of chronic engorgement, it is not best to persevere in an antiphlogistic course of treatment. The diet should be nourishing, but not stimulant. Any effusion into the tunica vaginalis should be evacuated and the scrotal organs carefully strapped. The bowels should be kept free, and marked benefit will be derived from small doses of mercurials, as, for instance, a few grains of blue mass administered every night at bedtime.

Opinions as to the propriety of treating the urethritis during an attack of swelled testicle have been widely different. Those who believe in the metastatic origin of epididymitis, have not only refused to take measures to cure the urethral discharge while the testicle was still inflamed, but have even advised that the urethra should be irritated by bougies or otherwise, so as to recall the disease to its original seat. Such practice is founded on a false assumption, and is both useless and dangerous. The continuance of the urethritis can only aggravate the epididymitis, or tend to produce a relapse if it has already subsided. The cure of the urethral discharge can alone afford security for the future. This, however, is not to be attempted by irritant injections. I am in the habit of employing the injection of glycerin, extract of opium, and sulphate of zinc, which I have recommended in the acute stage of gonorrhœa, never, however, adding a sufficient quantity of the sulphate to excite more than a momentary prickling sensation in the canal. The following formula is generally applicable:—

℞. Extracti opii ℈j.
Glycerin ℥j.
Zinci sulphatis gr. vj–xij.
Aquæ ℥vj
M.

Copaiba and cubebs have no curative action upon epididymitis, and I think it best to abstain from using them when this complication supervenes.

There are two other modes of treating gonorrhœal epididymitis which require notice. The first is that proposed by M. Velpeau, and consists in puncturing the tunica vaginalis and evacuating the contained fluid, no matter how small its quantity. This procedure has already been recommended above, when the fluid has attained an appreciable amount. The peculiarity of M. Velpeau's practice lies in the frequency with which he employs it, even where a few drops only escape from the incisions. He claims for this method that it gives immediate relief to the pain, that it shortens the duration of the disease, and takes the place of leeches and other troublesome and expensive remedies. Cullerier also accords high praise to this practice. The dread of the knife which patients laboring under this disease naturally have, is a strong objection to its frequent employment. As a general rule, it is safe, for in one case only, so far as I am aware, has it been attended with any unpleasant result. This was a patient under the care of M. Montanier,[1] in whom excessive hemorrhage followed a simple incision into the tunica vaginalis, which was very difficult to control, and which even endangered life. Probably some scrotal artery of considerable size was wounded in the operation.

The late M. Vidal (de Cassis) revived an operation which is said to have originated with a French surgeon by the name of Petit, who published a work on venereal in 1812. This operation is simply an extension into the substance of the testicle of the incisions recommended by Velpeau. Vidal states that he first employed these incisions in swelled testicle when the body of the testicle was involved, to which form of the disease he gives the name of parenchymatous orchitis. His design was, by dividing the tunica albuginea to relieve the constriction exercised by this fibrous tunic upon its inflamed contents. Finding, as he says, that the operation was unattended by any unpleasant result, and that it relieved the pain and hastened resolution, he extended it to the more frequent cases in which the epididymis is alone attacked, and found the effect

[1] See the Gaz. des Hôpitaux, 1858, p. 106.

equally favorable. In his work on venereal, this author states that he has performed this operation with impunity in four hundred cases, and claims for it preference to all other modes of treatment. His directions as to the manner of performing it, are to incise the tunica albuginea with a bistoury or lancet passed through the scrotum and tunica vaginalis to the extent of six-tenths of an inch (*un centimètre et demi*), and to penetrate the parenchyma of the testicle to the depth of less than three-tenths of an inch (*de moins de moitié*). Only one puncture of this kind is to be made. In spite of M. Vidal's testimony in its favor, we can hardly believe this operation entirely devoid of danger, especially since the recent report of four cases observed by a single surgeon, M. Demarquay, in which the substance of the testicle gradually oozed from the incision in filaments, and in three of which the testicle was totally lost.[1] If resorted to at all, it should probably be reserved for those cases in which it was first used, viz., where the body of the testicle is extensively implicated.

Numerous other topical remedies have been recommended in gonorrhœal epididymitis, but many of them are not worthy of mention. Inunctions of mercurial ointment upon the scrotum may relieve the pain, but are liable to cause salivation. They may be used with caution in those cases in which the acute symptoms have subsided, leaving chronic engorgement of the epididymis. The application of chloroform has been advised, but before affording ease it usually increases the pain and renders it almost insupportable.

The active treatment by leeches and purgatives, above recommended during the acute stage of epididymitis, includes the best prophylactic measures that we can adopt to prevent any induration being left behind in the epididymis. If such be detected, however, the earlier it is attacked the better, for the chances of success are certainly superior, while the plastic material is not yet fully organized. If the indurated epididymis is still abnormally sensitive to pressure, the application of a few leeches over the cord, repeated several times at intervals of a few days, will be found of service. A small quantity of mercurial ointment should be rubbed into the scrotum morning and night; the genital organs should be well supported by a suspensory bandage, and the bowels be kept free. Much is to be expected also from the internal administration of iodide of potassium, which is so powerful an agent in resolving inflammatory

[1] British and For. Medico-Chirurg. Rev., Am. ed., Apr. 1859, from the Bulletin de Thérapeutique, tome lv., p. 549.

products generally. It is impossible to say how old an induration of the epididymis can be treated with hopes of success. M. Gosselin's cases show that it may disappear after existing for several months, and it is not improbable that a cure may be effected after a much longer period. Where the epididymis on both sides is affected, the attempt should certainly be made, especially if the patient is young and intends to marry. It is a serious question whether the surgeon should inform him of the impotency which his disease entails, since the effect upon his mind might possibly be most disastrous.

CHAPTER VII.

INFLAMMATION OF THE PROSTATE.

ACUTE PROSTATITIS.

ACUTE prostatitis may be due to violence from sounds, catheters, or lithotrity instruments; to the application of caustic to the deeper portions of the urethra; to stricture, the irritation of a stone in the bladder, immoderate coitus, or excessive purgation; but by far the most frequent cause is urethral gonorrhœa.

Gonorrhœal prostatitis owes its origin to the extension of the inflammation from the urethral walls to the substance of the prostate gland; it occurs, therefore, at a time when the disease has invaded the deeper portions of the canal, and is consequently rare during the first two weeks of a gonorrhœa; resembling in this respect its more frequent congener, gonorrhœal epididymitis. The accessory causes of the last mentioned disease, viz., highly irritant injections, forcible distention of the urethra in using a syringe, excessive exercise, alcoholic stimulants, exposure to cold and wet, and venery, may also contribute to the production of prostatitis. There is less ground for believing that this affection is occasioned by the use of copaiba and cubebs, unless in very immoderate doses.

The earliest symptom of an attack of prostatitis is commonly a sensation of weight or a dull pain in the perineum. There is not that vesical tenesmus which we find in cystitis, but the exit of the urine may be obstructed by the swollen gland, when the calls tc micturate will be frequent and urgent simply because the bladder is never fully emptied of its contents, and a short time suffices to fill it to distention. The stream is generally quite small, is only forced out by prolonged straining, and excites a severe scalding sensation in the deeper portion of the canal. Complete retention of urine often occurs, requiring the use of the catheter. The bowels are commonly constipated, although the patient is constantly led by a feeling of fullness in the rectum to make fruitless efforts at stool; and should defecation take place, the act excites severe pain. The system at

large sympathises with the local trouble, and general febrile excitement ensues. Exploration of the prostate by the finger in the rectum reveals abnormal sensibility and tumefaction of this organ proportioned to the severity of the disease; and a sound introduced into the urethra, upon reaching the prostatic region, meets with an obstruction and excites a degree of suffering that is with difficulty endured by the patient.

Acute prostatitis may terminate in resolution, in suppuration, and, in rare instances, in gangrene. Several cases are recorded in which the inflammation has extended to the peritoneum, and in which death has ensued from peritonitis.

Of the above modes of termination, suppuration, next to resolution, is the most frequent. The formation of matter is not always announced by well-marked symptoms, but may be strongly suspected if, after the disease has been increasing in intensity for eight or ten days, the patient is seized with repeated chills followed by fever and general depression. It is possible, however, for an abscess to form without affording the least reason to suspect it. A case recently occurred at St. George's Hospital under the care of Dr. Pitman, in which prostatitis supervened upon an attack of gonorrhœa, and terminated in suppuration and the death of the patient, with entire absence of rigors and the ordinary symptoms of abscess of the prostate. At the post-mortem examination, an extensive abscess, which had not been suspected during life, was found between the bladder and rectum.[1]

The abscess may be situated between the rectum and the gland, in the substance of the latter, or upon its urethral aspect. In the first two instances, a soft fluctuating tumor can be felt in the region of the prostate by the finger introduced into the rectum, especially if the gland be immovably fixed by a sound in the urethra. An abscess in the neighborhood of the urethra is more difficult of detection, except from its encroachment upon the canal, and its interference with the exit of urine and the introduction of a catheter.

A prostatic abscess most frequently breaks upon the side of the urethra during the efforts of the patient to expel the urine or feces, or it is often perforated by the point of an instrument introduced for the purpose of exploration or catheterization; sometimes it opens into the rectum, bladder, or cellular tissue of the pelvis; or it may communicate with both bladder and rectum and give rise to a urinary fistula. In other instances the fluid contents are absorbed, and

[1] London Lancet, Am. ed., Jan. 1861, p. 69.

the abscess becomes surrounded by a kind of cyst which is filled with a semi-solid substance resembling a deposit of tubercle.

DIAGNOSIS.—Acute prostatitis is chiefly liable to be confounded with cystitis, from which it may generally be distinguished by the following characters:—

1. By the greater degree of constitutional disturbance; general febrile reaction being a much more frequent attendant of inflammation of the prostate than of the bladder.

2. The pain in prostatitis is more of a throbbing and bearing-down character, is chiefly confined to the perineum, and is less prone to radiate to the extremity of the penis and elsewhere than the pain of cystitis.

The chief means, however, of distinguishing these two diseases is to be found in physical exploration.

3. In prostatitis, the finger introduced *per anum* will detect the swollen and sensitive gland encroaching upon the rectum, and extending in some instances higher than the point of the finger can reach. In cystitis, the introduction of the finger within the anus may be painful in consequence of the inflammation extending to the recto-vesical wall, but no tumor can be felt.

4. In prostatitis, the passage of a catheter is attended with great pain and meets with obstruction in the prostatic portion of the urethra; and when it enters the bladder, a large amount of urine escapes. In cystitis, there may be some obstruction to catheterism, but this is situated at the vesical neck, and the bladder is found to be nearly empty of urine, since the extreme irritability of its walls does not permit any large collection.

TREATMENT.—The appearance, during an attack of gonorrhœa, of symptoms of prostatitis, should lead the surgeon at once to abandon the use of injections; and, neglecting the urethral discharge for a time, to direct his whole attention to the more serious affection which has supervened. The patient should now observe the most perfect rest and quietude. If the symptoms be at all severe, from six to a dozen leeches should be applied to the perineum, and be followed by a hot bath at the temperature of 100°, which may be repeated with benefit several times in the twenty-four hours. Some authors recommend the application of leeches by means of an anal speculum to the anterior wall of the rectum, where contiguous to the inflamed gland. In the intervals of the

baths the perineum should be covered with hot fomentations or poultices.

Internally we may resort to those remedies, as the salts of potash and soda, which are supposed to render the urine more dilute and mild in its character. The formula containing mucilage, bicarbonate of potash, and hyoscyamus, already given in the chapter upon urethral gonorrhœa in the male, is well adapted for the treatment of the disease we are now considering. The diet should be abstemious, consisting of gruel, mucilaginous drinks, milk, and farinaceous substances, at least in the early stages of the disease; at a more advanced period, and after suppuration has taken place, our utmost efforts may be required to sustain the strength of the patient by a nourishing diet and even tonics.

Sleep should be secured by the exhibition of a Dover's powder at night. Mr. Adams speaks highly of warm enemata, consisting of four or five ounces of simple water or gruel, administered at bedtime, which are said to afford comfort to the patient, and to act as a fomentation to the inflamed gland.[1]

Complete retention of urine will require evacuation of the bladder by means of a catheter. When an abscess has formed and fluctuation can be distinctly felt by the finger in the rectum, it should be punctured through the intestinal wall; or when the collection of matter is most prominent towards the urethra, it may sometimes be opened by a conical sound introduced as far as the prostatic portion of the canal, while a finger within the rectum presses the tumor against the point of the instrument. This attempt, however, is by no means free from danger, and should never be made, unless the symptoms are urgent and the existence of matter in the neighborhood of the urethra highly probable.

CHRONIC PROSTATITIS.

The preceding affection is that form of prostatitis which most frequently accompanies and originates in urethral gonorrhœa. Chronic prostatitis, on the contrary, is more commonly due to onanism, excessive venereal indulgence, or sedentary habits; and, although not unfrequently occurring in persons who have suffered from gonorrhœa, is in most cases less directly traceable to this affection.

For a long period chronic prostatitis was confounded with irrita-

[1] Anatomy and Diseases of the Prostate, p. 41.

tion and inflammation of the neck of the bladder, and was not recognized as a distinct disease until the publication of the admirable descriptions of it by Mr. Adams,[1] Mr. Ledwich,[2] and more recently by our distinguished countryman, Dr. Gross, of Philadelphia.[3]

Chronic prostatitis is most common in young men, and especially among those who lead a sedentary life, or who are the victims of masturbation. It is also met with in persons who have abused their sexual powers either in promiscuous intercourse or early married life.

One of the most frequent and prominent symptoms of this affection is a discharge of clear and transparent, or sometimes turbid, mucus from the meatus, which is found by the microscope to consist of: 1. "Morphous crystals of uric acid, or ammoniaco-magnesian phosphates; 2. Mucus-corpuscles; 3. Blood-disks; and 4. Epithelium cells,"[4] either with or without a few pus-corpuscles. The discharge may be almost constant in its appearance and sufficient in quantity to stain the linen, or, more frequently, it is forced from the urethra by the pressure of the hardened feces during straining at stool, and is not perceptible at any other time. Most patients suppose that it consists of semen, from which it may be distinguished under the microscope by the absence of spermatozoa. Very many of the cases of spermatorrhœa so-called are doubtless instances of this affection.

In most cases, the frequency of micturition is more or less increased; the stream of urine is ejected without force; the last drops dribble away, or are only expelled with considerable effort; and a scalding sensation is felt in the urethra during and after the act.

Pain and uneasy sensations are experienced in the perineum, thighs and lumbo-sacral region; there is often great irritation about the anus attended by hæmorrhoids or eczema; the bowels are constipated, and defecation difficult and painful; the passage of an instrument into the bladder excites severe pain as it passes through the prostatic region; on examination *per anum*, the gland is found to be tumefied, sensitive on pressure, and sometimes indurated; the patient is irritable and low spirited; is incapable of mental or phy-

[1] Anatomy and Diseases of the Prostate Gland. London, 1853.

[2] Dublin Quarterly Journal, Aug. 1857, p. 80.

[3] North Am. Med.-Chir. Rev., July, 1860. Dr. Gross describes this as a hitherto unknown affection under the name of "prostatorrhœa," but his account of it corresponds in almost every particular with that given by Mr. Adams under the head of "prostatitis from onanism." The increased secretion of prostatic fluid is a mere symptom of irritation or inflammation of the gland, and it is therefore desirable that the term prostatitis should be retained.

[4] Ledwich, op. cit.

sical exertion; suffers from weakness, headache, and dyspepsia; watches his symptoms with the greatest anxiety; imagines that he is losing his memory, that he is impotent or affected with syphilis, and, in short, becomes a desperate hypochondriac.

Independently of its action upon the nervous system, chronic prostatitis is not a serious, although a very obstinate disease. It never terminates in suppuration and abscess, nor in the chronic hypertrophy so common in old men.

Mr. Ledwich has had an opportunity, in two instances, of becoming acquainted with the pathology of this affection; "one case occurred at the age of 18, the second at 30; both were well-marked examples of the disease, and succumbed to phthisis, but this latter had no connection with the urethral affection. The prostato-vesical plexus was full, and many of its branches varicose; the capsule of the prostate adhered intimately to its surface, and, on slicing the gland, it seemed soft, with large, open, venous branches on the section, from which blood exuded, whilst the whole gland exhibited an augmented volume; the mucous membrane of its urethral aspect was *red, soft,* thickened, and *villous,* whilst the ducts could be distinguished with the unassisted eye; the uvula and trigonum vesicæ were red and turgid, but the remainder of the bladder was healthy. I examined with some anxiety for the presence of tubercular deposit in the gland, but, although this morbid condition was often anticipated, no evidence of any such structural lesion could be detected. The seminal ducts did not present any alteration as to size, their excretory orifices being discovered with the greatest difficulty, the vesiculæ seminales being full and swollen, but without any other abnormal appearance; scrofulous tubercles existed in the epididymis, yet the testicles, although soft and small, were otherwise healthy."

TREATMENT.—In most cases of chronic prostatitis, the patient is laboring under a combination of mental as well as physical symptoms, and the treatment must be directed to the mind equally with the body. It is not sufficient in these cases to dash off a hurried prescription and dismiss the patient after five minutes' conversation. The victim of mental more than physical suffering has for weeks or even months been brooding over his complaint during all his waking moments, not absolutely necessary to his daily occupation, exaggerating each trifling symptom, entertaining the most gloomy forebodings of the future, and perhaps contemplating suicide. First of all, he needs a friend who can lead him, however reluctantly, to

unburden his mind of its sorrow. This load removed, he at once feels lighter and more hopeful. The surgeon's first object, therefore, should be to gain his confidence by friendly yet manly conversation, lending a ready ear to the familiar story of the hypochondriac, encouraging him to feel that he has found a sympathizing friend as well as physician, and gradually and skilfully leading him from the depths of despondency to more rational views of his position and prospects in life.

One great source of anxiety to the patient is probably the idea that the transparent viscid discharge which appears during straining at stool, or is mingled with the last drops of urine, consists of semen. The surgeon is generally safe in assuring him of the contrary, without special examination, since diurnal spermatorrhœa without some degree of spasmodic action is exceedingly rare; but any doubt upon the subject may be removed by placing a drop of the fluid under the microscope, which will probably confirm his assurance by showing the absence of spermatozoa.

Most cases of chronic prostatitis require the administration of a tonic, as iron, of which the tincture of the chloride, in the dose of twenty drops after each meal, is one of the best preparations. I have also obtained favorable results from a solution of strychnine in dilute phosphoric acid:—

℞. Strychniæ gr. j.
Acidi phosphorici diluti ℥iij.
M.

A teaspoonful three times a day.

Ergot, either alone or combined with camphor, is another remedy which may often be employed to advantage.[1]

The large proportion (about two-thirds) of muscular fibre entering into the composition of the prostate, explains why affections of this body are but slightly amenable to those remedies, as iodine, the action of which is so favorable upon organs strictly glandular.

Chronic inflammation of the prostate is perpetuated by the constipated state of the bowels and consequent straining at stool which usually attends it, and which should, therefore, be obviated by laxatives or enemata; but aloes, which is a constituent of most of our pharmaceutical preparations for this purpose, should be avoided, on account of its well-known tendency to produce congestion of the hæmorrhoidal vessels. Saline cathartics may be administered in

[1] See an article by Dr. C. L. Mitchell, on Ergot in Spermatorrhœa, Congestion, and Irritation of the Genital Organs in the Male; Am. Medical Monthly, April, 1861, p. 283.

small doses in the morning on rising; but I much prefer enemata of cold water, taken immediately before the usual time of going to stool, which are followed by a loose evacuation unattended by straining, and which prevent the discharge of prostatic fluid. In cases complicated with gleet, and in the absence of acute inflammation, benefit may be derived from weak astringent urethral injections.

As a general rule, local applications may be dispensed with, and are so far objectionable as they tend to direct the thoughts of the patient to the seat of his disease. Yet when decided tenderness of the prostate is found on examination *per anum*, the repeated application of leeches or blisters to the perineum will prove beneficial. The late Dr. J. C. Warren, of Boston, highly recommended in these cases the use of the cold douche to the perineum. Moderate sexual indulgence is found to relieve the morbid irritability of the genital organs, and matrimony, when practicable, should be recommended to those who are single.

CHAPTER VIII.

INFLAMMATION OF THE BLADDER.

CYSTITIS is another complication of gonorrhœa, occurring as a consequence of the extension of the inflammation along the continuous mucous surface common to the urethra and bladder. It has also been attributed in rare instances to the gonorrhœal discharge finding its way, or being forced into the bladder, and there lighting up inflammation similar to that affecting the urethral walls. A case of this kind is reported in the *Arch. Gén. de Médicine*,[1] in which cystitis suddenly supervened after using a simple emollient injection. All those causes which aggravate the urethritis may concur in exciting cystitis, among which may be mentioned sexual intercourse, indulgence in alcoholic stimulants, including malt liquors, fatigue, and the use of highly irritant injections. Cystitis never occurs at the commencement of an attack of gonorrhœa, but usually towards its decline, after the disease has had time to invade the deeper portions of the urethra.

Gonorrhœal cystitis is almost always confined to the neck of the bladder. The first symptoms that attract the attention of the patient are a frequent desire to pass his urine, and a feeling of heaviness in the perineum, which is frequently accompanied by a tickling or itching sensation at the extremity of the penis. The urine is high colored, and deposits upon standing a more or less copious, stringy, and whitish sediment, composed chiefly of pus and mucus; and the urethral discharge usually becomes more free and purulent. In the majority of cases, there is little or no febrile disturbance, the appetite is unimpaired, the patient sleeps well, except that he is called up several times in the night to pass his water, and feels on the whole about as well as usual.

In other cases, the symptoms are much more severe; there is decided pain in the perineum and across the hypogastric region

[1] Tome xiii., p. 454, 1829.

radiating to the head of the penis, the testicles, and the groins; the desire to micturate recurs every few minutes, when only a very small quantity of dark-colored urine can with difficulty and pain be evacuated, followed sometimes by a few drops of pure blood, and usually by most distressing tenesmus at the vesical neck, which the patient endeavors to relieve by pressing upon the perineum with one hand, while with the other he pinches the extremity of the penis. In such cases, there is usually some degree of febrile disturbance, indicated by a frequent pulse, loss of appetite, anxiety of countenance, general depression, and intense thirst. Retention of urine, which we have seen to be common in prostatitis, is rare in gonorrhœal cystitis; but it occasionally occurs as a consequence of loss of contractility in the vesical walls, and the distended bladder can then be felt above the pubes.

As stated by Lallemand, inflammation confined to the neck of the bladder may be recognized by the peculiar phenomena attending catheterization. "In proportion as the instrument advances through the curved portion of the urethra, the pain of its introduction increases, and, when it reaches the vesical neck, becomes intolerable. The neck of the bladder closes as the catheter approaches and is pushed on before it; so that the instrument may appear to have entered the bladder, but, if left to itself, is partially forced out of the canal by the restoration of the neck to its natural position. Under these circumstances nothing would be gained by using force, which, moreover, is capable of doing much harm. The catheter should be left in place until the spasmodic contraction has passed off; when the vesical neck opens of itself and appears to draw the point of the instrument into the bladder by a kind of suction process accompanied by a slight to-and-fro movement. The pain at this time is especially severe; it appears to the patient as if the catheter were touching a raw surface; and considerable difficulty is experienced in withdrawing the instrument, owing to the contraction of the vesical neck around it."

In the exceptional cases in which the *bas-fond* of the organ is involved, there is frequent desire to go to stool and rectal tenesmus; severe inflammation of the recto-vesical septum may ensue, rendering the introduction of the finger or an enema-tube within the anus extremely painful; while in some instances the valvular outlets of the ureters are closed by the tumefaction of the vesical walls, giving rise to distention and dilatation of the ureters. In rare instances, as noticed by Sir Benjamin Bell, Morgagni, Vidal and others, the

inflammation extends along the ureters and involves the kidneys. In Morgagni's case, the patient died, and an abscess was found in one of the kidneys on post-mortem examination.

Acute cystitis most frequently terminates in resolution, though sometimes, in the chronic form of the disease, in abscess situated in the substance of the vesical walls, or between the bladder and rectum; in hypertrophy, ulceration, rupture, or even gangrene. If rupture take place, the escape of the urine into the pelvic cellular tissue or peritoneal cavity, soon leads to a fatal termination.

TREATMENT.—The treatment of acute cystitis consists in the application of cups or leeches to the perineum and hypogastric region, prolonged immersion in warm hip-baths, hot fomentations and poultices to the hypogastrium, warm opiated enemata, and the internal administration of mucilaginous drinks in small quantities, with the addition of the nitrate or bicarbonate of potassa and henbane. In the rare cases in which retention takes place, catheterization is required, but should not be performed with unnecessary frequency, for fear of increasing the inflammation; and a permanent instrument is objectionable for the same reason. At the same time, the urine is rendered acrid and irritating by the admixture of mucus and pus, and should not be left to accumulate in large quantities.

In the chronic form of the disease, and in those cases which are subacute from the first, we may resort to counter-irritation over the hypogastric region by means of croton oil or tartar emetic ointment. The use of cantharides should be avoided on account of its tendency to provoke inflammation of the bladder, unless a stimulant effect upon the mucous membrane of this viscus be desired. Internally, copaiba, turpentine and especially ergot, which I have used with very satisfactory results either alone or combined with iron, are to be recommended.

℞. Vini ergotæ ℥iij.
Tr. ferri chloridi, ℥j.
M.

Dose.—A teaspoonful every six hours.

Dr. Thompson says that the decoction of senega exercises a greater influence over the secretion of the bladder in cystitis than any other remedy. The same surgeon also recommends an infusion of triticum repens (℥j ad aq. bull. Oj). I have had no personal experience with either of these agents.

In decidedly chronic cases of cystitis, injecting the bladder by means of a double catheter, first with tepid, then with cold water, and finally with some astringent solution, is of great value. I commonly employ either nitrate of silver (gr. j–v ad aquæ ℥j), alum, or Squibb's solution of persulphate of iron (ʒss. ad aquæ Oj), and repeat the application according to the effect produced, from once a day to once or twice a week.

CHAPTER IX.

GONORRHŒA IN WOMEN.

THE mucous membrane of the genital organs is far more extensive in the female than in the male. Besides lining the urinary canal and the vulva—parts corresponding to the urethra and balano-preputial fold in man—it is continued over the walls of the vagina, where its surface is increased by numerous folds, and, reflected over the os tincæ, extends into the cavities of the cervix and body of the uterus. Any portion of this extensive surface may be attacked by catarrhal inflammation, which, according to its seat, is called gonorrhœa of the vulva, urethra, vagina, or uterus. Some of these parts are more frequently affected than others. Thus, gonorrhœa of the vagina is more common than that of the urethra or vulva, and gonorrhœa of the uterus is the least frequent of all. It is rare for all the different portions of the female genital organs to be attacked together, though two or more are, in many instances, combined as the seat of gonorrhœal inflammation. The manner of union appears to be chiefly determined by the anatomical relation of the parts. Thus, when the vulva is affected, the urethra and lower portion of the vagina are likely to be involved; while, on the other hand, the upper part of the vagina and uterus are not unfrequently implicated together.

CAUSES.—Gonorrhœa is a much less common disease in women than in men. This may be accounted for by several reasons. The mucous membrane of the vagina is less sensitive than that of the male urethra; it receives no little protection from the sebaceous and mucous secretions which constantly cover it; the size of the passage is such that it can be readily cleansed; and the urethra, in consequence of its being but very slightly concerned in the sexual act, and of the situation of its meatus, is less exposed to contagion. But another reason, and one perhaps of still greater weight, is to be found in the absence in men of those chronic discharges, the presence of which in women is so fruitful a cause of urethritis in the opposite

sex. When speaking of the causes of gonorrhœa in the male, I endeavored to show that it is frequently due to the irritation produced by a leucorrhœal discharge, by the menstrual flow, or by the normal secretions of the female genital organs. Women, in sexual intercourse, are not exposed to these exciting causes of gonorrhœa. In a condition of health, there is no secretion about the male genital organs capable of exciting inflammation in the female; while during the acute stage of gonorrhœa the pain excited by turgescence of the penis is generally sufficient to deter from coitus, and even in cases of gleet, the amount of the discharge is so small, the urethra so frequently cleansed by the passage of urine, and the vagina so well protected by sebaceous matter, that intercourse may often take place without much exposure to the woman. Owing to these circumstances, women more frequently communicate than receive gonorrhœa.

It would seem to be a fair deduction from the foregoing, that, taking a given number of gonorrhœal cases in the two sexes, more are due to infection in women than in men; and such I think is unquestionably the fact. But while assigning to direct contagion the first place in the etiology of the gonorrhœa of women, other influences must not be overlooked. These, however, are less appreciable in the female than in the male. The history of women seeking advice for gonorrhœa can rarely be ascertained with certainty, or their disease traced with accuracy to its source. It is notorious that a woman often receives the embraces of several men within a short space of time, and there are many reasons for her concealing important facts which a man would readily confide to his physician. It is, therefore, only under peculiar circumstances that we can satisfactorily ascertain the origin of gonorrhœa in women; still, opportunities for such investigation do sometimes occur, and, in several which I have met with, it was evident that the disease was due to other causes than contagion. Thus, I have known intercourse with a healthy man to excite acute and extensive inflammation of the genital organs in women suffering from leucorrhœa and congestion of the cervix, especially if the stimulus of liquor was added to that of coitus. In such cases, chronic may readily be transformed into acute inflammation, in the same way as a gleet in man may be changed into a clap. In some instances, I have had reason to believe that the frequent repetition of the sexual act has produced gonorrhœa in women free from any previous disease, and it is a well established fact that a purulent discharge sometimes follows the first exercise of marital rights, although there may have been no laceration of the female genital organs. In general, the causes of gonorrhœa in wo-

men, independently of contagion, may be enumerated as follows: Immoderate sexual intercourse, violence, masturbation, the presence of vegetations, syphilitic or other eruptions, errors of diet, ascarides in the rectum, and the external influences of cold, moisture, etc.

Many women have, during pregnancy, a muco-purulent discharge, which usually makes its appearance after the fourth or fifth month, though sometimes before, and chiefly affects the upper portion of the vagina. An examination of the vaginal mucous membrane reveals the existence of numerous granulations, similar to those observed also in some cases of vaginitis from contagion. Cazeaux states that this discharge may produce disorder of the digestive functions, as shown by the coexistence of gastralgia, which is more or less severe according to the intensity of the vaginitis.[1] The discharge usually disappears spontaneously after the termination of gestation.

Vaginitis may be attendant upon *scarlet fever*, or it may follow this and the other exanthemata as a sequela.[2]

Very *young girls* may be attacked with inflammation of the genital organs, producing a copious purulent discharge from the vulva, and sometimes from the vagina also, the cause of which has often been misapprehended. It has been supposed that the disease was contracted from men who had been seen to caress or fondle them, and innocent persons have been arrested and tried on this charge. No one in such cases has done more for the honor of our profession and for the cause of humanity than Mr. Wilde, of Dublin, who has repeatedly come forward when the accused party was about to be convicted for an offence which he never committed, has shown the groundlessness of the charge and proved his innocence. In most cases, the discharges in question are no more venereal in their nature than the otorrhœa which is so common in children. Their predisposing cause is general cachexia, or, as it is commonly called, a strumous diathesis. The exciting cause may be deficient cleanliness, derangement of the digestive functions, the irritation of teething, and the presence of ascarides in the rectum, or within the vulva, where they may have found their way from the gut. Such discharges are contagious when applied to the ocular conjunctiva, and not less so, in all probability, if brought in contact with the genital organs of a second person; thereby proving that the contagiousness of gonorrhœal matter depends upon the seat of the disease, and not upon

[1] Traité de l'Art des Accouchements, 4e édition, p. 817.

[2] Cormack, London Journal of Medicine, Sept., 1850, p. 872; and Barnes, Medical Gazette, July 12, 1850, p. 65.

the presence of a specific poison necessarily transmitted from one individual to another.

SYMPTOMS.—The initiatory symptoms of gonorrhœa in women are often obscured, in the rare instances afforded for their examination, by the previous existence of a leucorrhœal discharge. They do not differ from the early symptoms of inflammation of other mucous membranes, and consist in the gradual development of swelling, redness and tenderness, and an increase of, and change in, the secretion of the part. The discharge varies in consistency and color as in gonorrhœa in the male. It is at first transparent and mucous, then muco-purulent, and finally, when the disease has attained its height, thoroughly purulent. When secreted by the vagina it is acid, fluent, creamy, and readily removed from the surface; when derived from the cavity of the cervix,[1] without being mixed with the acid matter of the vagina, it is alkaline, nearly transparent, tenacious like the white of egg, and very adhesive. Examined under the microscope, the vaginal secretion is found to consist of pus-corpuscles, mucus, an abundance of epithelial scales and flakes of epithelium in masses; while the viscid plug drawn from the cervix, which, as shown by Dr. Tyler Smith, is glandular in its structure, exhibits mucus-corpuscles, oil-globules and purulent matter. The consistency and yellowish color of the vaginal secretion are dependent upon the quantity of organized elements it contains. The thicker it is, the more opaque, and the more resemblance it bears to cream or pus, the greater the quantity of pavement epithelium and pus-globules, as shown by the microscope.[2]

M. Donné has also called attention to the presence of a small infusorial animalcule which he at first supposed to be pathognomonic of gonorrhœal vaginitis. He has since renounced this opinion, but still asserts that the *Trichomonas* is not seen in healthy vaginal mucus, but only when there is a large admixture of pus-globules. Farther researches by Kölliker and Scanzoni[3] would show that it is never present in the secretion of the cervix, so that it cannot be a mere cell of ciliary epithelium, and these authors state that there can be no doubt of its independent animal nature. It was first

[1] The most convenient method of collecting the cervical secretion for the purpose of examination, unmixed with the vaginal mucus, is by means of Lallemand's porte caustique, uncharged.

[2] Pathology and Treatment of Leucorrhœa, Phil. ed., 1855, p. 122.

[3] Das Secret d. Schleimhaut d. Vagina und des Cervix Uteri. SCANZONI's Beiträge, Bd. ii., p. 128. Würzburg, 1855.

found by them in pregnant women, and, after their attention was called to it, in more than half the women whom they examined. Hence it cannot be considered as characteristic of gonorrhœa. Still, it is never met with in perfectly healthy mucus, destitute of pus-globules. It appears to depend upon certain changes in the vaginal secretion, and is not developed to any extent except in mucus which is clearly abnormal.[1]

Traces of a discharge from the genital organs are to be sought for chiefly upon the posterior portion of a woman's linen, and not upon the anterior. The absence of any external evidence of disease does not, however, prove her sound; since the upper portion of the vagina may be inflamed and the secretion be retained within the vulva. The symptoms of gonorrhœa in women vary according to the part affected, and it is convenient to make a corresponding division in their description, recollecting, at the same time, that the different forms may be more or less combined in a given case.

Gonorrhœa of the vulva is less common than that of the vagina, and, in many cases, is secondary to the latter, being produced by contact with the discharge flowing from above. It is, however, often primary, and is that form which is commonly met with as the result of violence, or the presence of vegetations and syphilitic or other eruptions, as venereal ulcers, mucous patches, etc. The gonorrhœa of young girls, already referred to, is also, in most cases, vulvar.

The patient's attention is early attracted to the part by a sensation of heat and pruritus. On examination, the mucous membrane is found to be reddened, tumefied, and more moist than natural. As the disease advances the discharge increases in quantity and becomes muco-purulent, or purulent, and very offensive. The labia and nymphæ are swollen to such a degree that it is almost impossible to expose the orifice of the vagina. If the nymphæ be naturally large, they may swell to such an extent as to protrude beyond the labia and become constricted; a condition which may be compared to paraphymosis. The mucous membrane may be deprived of its epithelium in patches, identical in character with the superficial excoriations of balanitis. The inflamed parts are exceedingly sensitive to the slightest touch or pressure, and motion is very painful. The last drops of urine fall upon the excoriated surface and give rise to severe scalding. The discharge collects in the hair on the mons veneris and upon the external surface of the labia, and flows

[1] Traité Pratique des Maladies des Organes Sexuels de la Femme, par F. W. DE SCANZONI; traduit de l'Allemand, Paris, 1858, p. 452.

upon the integument of the perineum, and upon the upper portions of the thighs. Wherever it remains for any length of time it irritates and inflames the skin, which soon assumes an erythematous or even excoriated condition, and itself secretes an acrid humor. If the discharge comes in contact with the anus, as is very likely to occur when the patient lies upon the back, it may produce irritation of the rectum, attended with frequent desire to go to stool, pain on the passage of the feces, and sometimes slight diarrhœa.[1]

The sexual desires are often heightened, and amount at times to nymphomania, but coitus is attended with severe pain, if it even be possible. No other form of gonorrhœa in women equals this in the suffering which it occasions. This is partly owing to circumstances already mentioned, and partly also to the great sensibility possessed by the vulva in common with other outlets of mucous canals. The general system sometimes sympathizes with the local disease, and the patient is found to be hot and feverish. All cases of vulvar gonorrhœa are not, however, so severe as that just described. Instances occur in which there is but little redness, tumefaction, or sensibility, and merely an increase of the secretion of the part; and the symptoms may vary all the way from this mild character to the intensity of the above description.

The anatomy and pathology of the glandular apparatus of the female genital organs have been admirably given by M. Huguier,[2] and no account of vulvitis would be complete without including a description of the changes which take place in these bodies. The vulva is abundantly supplied with sebaceous and muciparous follicles, which are lined by a prolongation of the mucous membrane. Travelling along this continuous surface the inflammation readily gains access to the interior of the follicles, which soon pour out a thick purulent secretion from their mouths.

The entrance to the vagina is also provided with two larger and more deeply situated secretory organs, which, although noticed by several anatomists subsequent to the seventeenth century, were comparatively unknown up to quite a recent date. These glands were first discovered by Duverney in the cow, and afterwards by Bartholin in woman, but, having been sought for in vain by Haller, they were entirely forgotten, until attention was again called to them, in 1840, by Tiedmann,[3] of Heidelberg, and by M. Huguier, of Paris, in 1850. They are now known by the name of Duverney's,

[1] Baumès, Précis sur les Maladies Vénériennes, t. ii., p. 163.
[2] Mémoires de l'Académie de Méd., 1850, p. 529.
[3] Von den Duverneyschen Drüsen; Heidelberg, 1840.

Bartholin's, Cowper's, or the vulvo-vaginal glands. They are situated, one on either side of the entrance to the vagina, in the triangular space, bounded by the ascending ramus of the ischium, the vaginal orifice, and the transversalis perinæi muscle, and are covered by the superficial perineal fascia, and some fibres of the constrictor vaginæ. Their size varies in different subjects, and they appear to be largest in women addicted to sexual intercourse. When most developed their diameter usually measures about six-tenths of an inch. They are conglomerate glands, consisting of congeries of small tubes, surrounded by a common envelope, and during the act of coitus, pour out a copious secretion of albuminous fluid, by means of a duct six or seven lines in length, opening just in front of the hymen, or near the lateral and posterior carunculæ myrtiformes, which often conceal the orifice.

The inflammatory process may invade this duct and the gland beyond it, in the same manner that it does the superficial follicles; and when suppuration has taken place, if the matter do not find free exit through the natural outlet of the gland, an abscess is formed either within the dilated duct, or in the substance of the gland itself; the former being generally the case when gonorrhœa is the exciting cause.

Now, abscesses in the neighborhood of the vulva are quite common in cases of vulvitis, and though some of them are situated in the submucous cellular tissue, yet most of them are of the character above described, and are seated in the vulvo-vaginal gland or duct. A frequent and peculiar feature which marks them, is the facility with which, having once emptied themselves, they again fill up on the occurrence of any slight cause, as a return of the menstrual period, indulgence in sexual intercourse, exacerbation of the vulvar inflammation, etc. This circumstance has led some authors to the erroneous conclusion that these abscesses are surrounded by a true cystic wall, whereas their envelope continues to be, as at first, either the dilated duct or gland, which, to a certain extent, performs the office of a cyst. These glandular abscesses, however, may generally be recognized without much difficulty. The patient complains of a "swelling" in the vicinity of the vulva, which, on examination, is found to occupy the lower third of the labium, and border upon the posterior commissure. The affected side is more prominent than its opposite, and the labium is pear-shaped, with its broader extremity directed backwards and inwards towards the median line; the integument on its external aspect preserves its normal color, and is free and movable, while the internal surface of mucous

membrane is red and adherent to the tumor. The part is exceedingly sensitive to the touch, and the patient can neither walk, stand, nor sit, without difficulty, owing to the pain excited by the slightest pressure. The contents of the tumor are occasionally discharged through the normal duct of the gland, but usually, unless art intervene, the abscess bursts in the neighborhood of the glandular orifice, and very rarely on the external or integumental surface of the labium. M. Huguier contradicts the statement made by Vidal and other authors, that a recto-vaginal fistula is liable to form. This never occurs, according to the first named surgeon, if the rectum be in a sound condition. The frequent recurrence of abscesses of the vulvo-vaginal gland, or duct, is a source of great annoyance to women of the town, when suffering from chronic inflammation of the vulva.

Dr. Salmon[1] has called attention to certain cases of gonorrhœa, in which the vulvo-vaginal gland and duct are alone affected; the remainder of the genito-urinary organs retaining their normal condition. According to this surgeon, the affection is quite common, and especially so among young prostitutes, in whom it would seem to be due to the irritation of coitus upon parts as yet tender. The patient experiences no pain or inconvenience, and an examination, such as is ordinarily made, might lead to the conclusion that the genital organs were sound; but if the labium, on one or both sides, be firmly pressed against the ramus of the ischium, the gland, which is not perceptible to the touch in a state of health, may be felt as a moderately firm tumor, and its muco-puriform contents are seen to escape from the orifice of the duct. Dr. Salmon is of the opinion that vulvo-vaginal gonorrhœa will explain many cases in which a clap is contracted from a woman apparently healthy. Farther researches, however, are requisite to establish beyond a doubt the statement, that it is a common occurrence for gonorrhœa to affect primarily and exclusively the parts in question; although, after the subsidence of an attack of vaginitis or vulvitis, the inflammation may undoubtedly lurk for an indefinite period in the vulvo-vaginal gland and duct.

Vaginitis is more common than any other form of gonorrhœa in women. The whole extent, or only a portion of this passage may be inflamed. The lower part is more or less implicated in most cases of vulvitis, while frequently the upper part is alone involved, and the woman might be supposed free from disease, if not examined

[1] Med. Times and Gaz., Dec. 23, 1854, p. 646, quoted from L'Union Médicale.—Braithwaite's Retrospect, Part 31, p. 208.

with the speculum; especially as, from the comparative insensibility of the upper portion of the vagina, her sensations are an unreliable index of its condition. Ricord states that the posterior wall of the vagina is more frequently affected in leucorrhœa, and the anterior wall in gonorrhœa.

The modern application of the speculum to the study of venereal diseases (for which we are indebted to Ricord) has rendered an affection, which was before obscure and of difficult diagnosis, at once clear and easily recognizable; and the zeal, of late years, brought to the pathological investigation of the female genital organs, has induced many observers to describe the lesions of vaginitis with great minuteness and detail. It is not to be regretted that these lesions have been subjected to so severe a scrutiny, although they have for this reason acquired an unmerited degree of importance, since it has been shown that they are characterized by no features sufficiently peculiar to indicate their venereal origin, and that they are, in nearly all respects, identical with the more familiar morbid appearances of other mucous membranes, as the conjunctiva oculi, the lining membrane of the mouth, ear, etc.

The speculum should not be employed during the acute stage of vaginitis, as it is likely to excite severe pain and irritate the inflamed tissues. The presence of the catamenia is also a contraindication to its use. The ordinary cylindrical instrument, made of glass and coated with a layer of India rubber, is of easy introduction, and is generally sufficient for the examination of the vagina in suspected cases of gonorrhœa, but when it is desired to make local applications, or when thorough exposure of all the recesses of this passage is requisite in order to discover if any concealed chancre, or chancroid, be present, a valvular speculum should be preferred. In order to remove the discharge which may obstruct the field of vision, the surgeon should provide himself with several swabs, which may be conveniently made by winding cotton wadding around the end of a thin splinter of wood. The patient may lie in the "obstetric position" upon her left side, or, as I prefer, upon her back, with the knees drawn up; and delicacy requires, even when treating a woman of the town, that she should be covered with a sheet.

When the vaginitis is intense and seen at an early period, a portion or the whole of the vaginal walls may be found red, hot, and dry, and entirely destitute of moisture. Ricord states that in several instances he has seen this condition finally terminate in resolution without the slightest discharge appearing at any time. Similar cases of dry or erysipelatous gonorrhœa have been reported as occurring

in men, although the impossibility of examining the internal surface of the urethra throughout its whole extent has left them open to criticism. Generally, however, this dry condition of the vagina, if present at the outset, is succeeded in the course of twenty-four hours by the appearance of a discharge, which, at first transparent, afterwards undergoes changes similar to those which occur in gonorrhœa in the male; and when the disease has attained its height, the vaginal walls are bathed with offensive purulent matter of a creamy or greenish color, or sometimes streaked with blood. Before proceeding with the examination, the field of the speculum must be cleared from the discharge by the assistance of the swabs of cotton-wadding, when the mucous membrane will be exposed. This surface is found to be red and tumefied. The redness varies in intensity and also in extent. It is sometimes uniform and at others arranged in spots or striæ. Frequently patches are seen from which the epithelium has become detached, forming superficial abrasions similar to those met with in balanitis, or resembling blistered surfaces. Another condition which is at times met with has received the name of granular vaginitis. It consists in a development of the vaginal papillæ, which project above the surrounding surface, and are readily recognized by their darker red color. These granulations are most frequently observed in the upper part of the vagina, where they may exist in large numbers covering the whole surface, or they may be merely scattered here and there. They have been erroneously regarded by Dr. Deville as peculiar to the vaginitis of pregnant women.[1] They are analogous to the granulations which are so common upon the palpebral conjunctiva. Ricord says that, in one case of vaginal gonorrhœa, he observed an eruption presenting every appearance of herpes phlyctenodes situated upon the deeper portion of the vagina, and Ashwell speaks of "herpetic pustules," which by bursting form ulcers.

In addition to the above symptoms, vaginitis is characterized by increased heat and sensibility. The former may be verified by introducing a finger within the vagina, when the parts will be felt to be much hotter than natural. The degree of sensibility varies, and is greatest when the vulva is also involved. In such cases, it is generally quite impossible to introduce a speculum owing to the pain which it excites; but when the disease is confined to the vagina this instrument may often be employed without causing much suffering. During the course of vaginitis, there is often a frequent desire

[1] Archives Générales de Méd., 4e série, vol. v., p. 305.

to pass the urine, and dull pain is felt in the hypogastric region, owing to sympathy excited on the part of the bladder.

Gonorrhœa of the vagina rarely continues any length of time without extending to the mucous membrane covering the *cervix*, which may exhibit lesions identical with those now described, but more especially patches of superficial abrasions. Gonorrhœa of the uterus is commonly confined to the cavity of the cervix. It is sometimes secondary in this situation, being occasioned by the extension of the disease from the vagina, while at other times it is primary, and if the patient be examined at a sufficiently early period, the parts may be found in a perfectly healthy condition until the uterus is exposed, when the lips of the os are seen to be tumefied and red, the cervix congested and enlarged, and its cavity filled with tenacious and transparent muco-purulent matter. This secretion owes its transparency to the alkali which it contains. It becomes curdled and opaque when mixed with the vaginal acid, and hence cannot always be recognized after it has descended into the vagina or is discharged from the vulva. The fact that gonorrhœa confined to the cervix uteri may readily be overlooked, may explain some of the cases in which a clap is derived from an apparently healthy woman.

The acute stage of vaginitis rarely continues longer than a week or ten days, and may be of much shorter duration. As the acute symptoms subside, the pain and difficulty of motion are diminished. The discharge becomes less copious and purulent, and the redness and tumefaction of the tissues gradually disappear. After this partial advance towards recovery, however, the disease often lingers for an indefinite period, and is extremely difficult to eradicate. The vaginal walls may seem to have recovered their normal condition having lost the morbid appearances which characterized the acute stage, but there is still a small amount of discharge from their surface or from the cervical cavity, which is capable of producing gonorrhœa in the male.

Gonorrhœa of the urethra usually coexists with that of the vulva, or vagina, and sometimes with that of the uterus alone. Cases, however, are reported in which this was the only part of the genital organs affected. Gibert met with three such instances;[1] Ricord with two,[2] and Cullerier with one;[3] and in several of them, it was noticed

[1] Gibert's first case was published in the Revue Médicale, t. i., 1834. He has also given two other cases in his Manuel sur les Maladies Syphilitiques, p. 284.

[2] Mémoires de l'Académie Royale de Méd., t. 2e, p. 159. Paris, 1833.

[3] Dictionnaire de Méd. et de Chir. prat., t. 4e, p. 253.

that the stains of the discharge upon the woman's linen were small and circular, instead of being large and irregular as in cases of vulvar and vaginal gonorrhœa.

The shortness of the urethra in women and the oblique position of the canal, which favors the spontaneous flow of matter, render the diagnosis of the urethritis less easy than in the male. The discharge in cases of vulvitis, also, being seen, as might easily happen, in the vicinity of the meatus, may be erroneously supposed to come from that orifice. Again, the passage of urine causes all traces of urethritis to disappear for a time. An examination, in order to be conclusive, should be made at least an hour or two after an evacuation of the bladder, and any discharge around the meatus should first be removed. The finger may then be passed into the vagina, and pressure be made against the pubic arch, in the course of the canal, from behind forwards; when, if urethritis be present, one or more drops of purulent matter will appear at the meatus, the lips of which will be found swollen and inflamed; and the introduction of a sound into the canal is attended with considerable pain. Scalding during micturition may easily be a deceptive symptom, since it may be produced to a still greater degree by the contact of the urine with the excoriated mucous membrane of the vulva, when the latter is involved. If no vulvitis be present, it is a symptom of value. Gonorrhœa of the urethra, occurring in women otherwise healthy, does not show the same tendency to run into a gleet as in men. It almost always disappears before the accompanying vaginitis or vulvitis, and is therefore to be regarded as of secondary importance.[1] In broken-down constitutions, however, and in women who have borne many children, or who are suffering from congestion of the abdominal viscera, it may assume a chronic form, and prove exceedingly obstinate. A thickening takes place throughout the whole canal, which can be traced as a firm cord behind the pubis, and may be seen standing out in relief at the upper part of the entrance of the vulva, when the nymphæ are separated. This condition is attended with uncomfortable sensations in the part, and a frequent desire to pass water, aggravated by motion, by coitus and the return of the menstrual period, and relieved by rest and the recumbent posture.[2]

The value of urethritis as indicating contagion has been noticed

[1] Durand Fardel, Mémoire sur la Blennorrhagie chez la Femme, et ses Diverses Complications. Journal des Connaissances Medico-Chirurg., Juillet, Août, et Septembre, 1840.

[2] West, Lectures on the Diseases of Women, 2d ed. p. 618.

by many authors. In the majority of cases in which it is present, patients acknowledge that they have been exposed to impure intercourse. On the other hand, urethritis is absent in many cases in which the disease undoubtedly originated in contagion, and the fact is well established that it may depend upon uterine displacements and other causes independent of coitus; hence it cannot be said to furnish more than presumptive proof that a woman has been unchaste.

Complications.—Bubo is a less frequent complication of gonorrhœa in women than in men, and Ricord states that it very rarely occurs unless the urethra is affected.[1] Durand Fardel reports the case of a woman who had a rape committed upon her by several men, and in whom a bubo formed and terminated in suppuration.[2] An examination showed that she had acute inflammation of the vulva and vagina, and that there was no laceration or ulceration of the mucous membrane, yet the violent origin of the disease would excite suspicion as to the bubo being due entirely to the gonorrhœa. No mention is made of the condition of the urethra.

Vegetations, mucous patches or tubercles, chancroids and chancres, are frequently found to coexist with gonorrhœa of different portions of the female genital organs, and especially with vulvitis. Their presence is a constant source of irritation, and their removal is essential to a cure of the primary disease. Vegetations should be destroyed by the knife or caustics; mucous patches are a symptom of syphilis, and require general as well as local treatment; and chancres and chancroids are to be treated according to rules to be laid down hereafter.

As a general rule, gonorrhœa in women is confined to the external organs of generation, or does not extend above the cavity of the cervix, but cases are sometimes met with in which the internal surface of the body of the uterus is involved, or in which there is true metritis. In exceptional instances, also, the inflammation may extend to the Fallopian tubes, and even through the continuity of tissue, to the peritoneum. At the post-mortem examination of a case of this character, M. Mercier[3] found one of the Fallopian tubes obliterated by a deposit of lymph upon its fimbriated extremity, and the peritoneal surface inflamed to a considerable extent around it. West mentions two successive attacks of vaginitis, at an interval

[1] Notes to Hunter, 2d ed. p. 106. [2] Op. cit.

[3] Mémoire sur la Peritonite considerée comme Cause de Stérilité chez les Femmes; Gaz. Méd., 1838, p. 577; also Gaz. des Hôp., 1846, p. 482.

of eighteen months in the same patient, which were followed by such severe peritonitis as to call on each occasion for the abstraction of blood.[1]

Inflammation of the *ovaries* as a complication has also been seen by several authors, and has been compared to the swelled testicle which occurs in the male. The symptoms are well described in a case related by Ricord. The patient, aged thirty-two, an inmate of the *Hôpital du Midi*, was suffering from acute gonorrhœa of the uterus and external genital organs, when a swelling suddenly appeared in the left iliac fossa. The part was very sensitive to the touch and its temperature increased. There was considerable febrile excitement and nausea. The patient lay on her back, inclined a little to the left, with the thighs flexed. The discharge from the urethra and vagina had almost entirely disappeared. Pressure upon the neck of the uterus, with the finger introduced within the vagina, was not painful; but when the womb was pressed toward the right side, pain and a sense of tension were felt in the left broad ligament. Pressure toward the left side, tried for the sake of comparison, caused scarcely any inconvenience. The passage of the feces and urine, and all motion of the abdominal walls were painful. Under the use of antiphlogistic remedies, these symptoms gradually diminished and disappeared in about twelve days, and at the same time the discharge increased in quantity. The patient, however, was shortly afterwards seized with a second attack on the opposite side, with the same symptoms and the same suspension of the discharge.[2]

My friend Dr. Geo. T. Elliot, Jr., of this city, informs me that he has met with two cases of pelvic cellulitis, originating in gonorrhœa. So far as I am aware, this dangerous affection has never before been noticed as a complication of gonorrhœa in women. The statement of so accurate an observer as Dr. Elliot is entitled to great weight, but it is to be regretted that notes of the cases, essential to render them conclusive as evidence of the fact stated, were not taken.

DIAGNOSIS.—Before the application of the speculum to the study of venereal diseases, the diagnosis of gonorrhœa in women was often difficult and sometimes impossible; and the discharges of vaginitis and of various syphilitic lesions within the vulva were confounded together. To a surgeon of the present day, acquainted with modern

[1] Op. cit., p. 627.
[2] Notes to Hunter, p. 107.

methods of investigation, such mistakes are not likely to occur. With the recognition of the disease, however, our power, so far as diagnosis is concerned, ceases. It is impossible to go farther and determine its origin. Many authors have attempted to give diagnostic signs as between gonorrhœa originating in contagion and that produced by other causes, but they have all most signally failed to produce any which are at all satisfactory, simply for the reason that none such exist. "The microscope fails to furnish us with a means of distinguishing between gonorrhœal and simple vaginitis, and no symptom or combination of symptoms is absolutely conclusive on this point."[1] Acute inflammation and the presence of urethritis may render impure intercourse probable, but cannot be regarded as decisive; and what is wanting in the physical diagnosis must be sought for in the history of the case.

TREATMENT.—The treatment of the different forms of gonorrhœa in women varies but little in the acute stage of the disease. It is chiefly during the chronic stage that any variation is required to meet special indications, presented by inflammation of particular portions of the mucous membrane. Moreover, nature does not always, nor indeed in most instances, follow the classification which we have found it convenient to adopt; several of the genito-urinary organs are generally involved together—more commonly the vagina and vulva—and the treatment of this most numerous class of cases will first claim our attention.

The chief remedies adapted to the acute stage are rest, cathartics, hot baths, lotions, and a general antiphlogistic regimen. It is of the first importance that the patient should abstain from exercise of all kinds, and, if possible, be confined to her bed; indeed, in most cases her own sensations demand this, without the order of the surgeon. Meats and stimulants should be forbidden, and the diet restricted to weak tea, toast, a decoction of flaxseed, rice or barley-water, gruel, etc., unless the symptoms are subacute from the first, or the patient debilitated. In selecting a cathartic at the outset of the disease, preference should be given to a mercurial, for the purpose of unloading the abdominal and pelvic vessels, and the bowels should afterwards be freely opened every day, by small doses of Epsom salts, citrate of magnesia and other salines. Aloes, and the numerous preparations which contain it, should be avoided, on account of its tendency to produce congestion of the hæmorrhoidal vessels.

Leeches.—The local abstraction of blood is not generally necessary

[1] WEST, op. cit., p. 628.

except in decidedly acute cases, when from six to ten leeches may be applied in the neighborhood of the vulva. There is one serious objection to their use, however. We can never be certain—except after an examination with a speculum, which the sensibility of the parts in this stage does not permit—that there is not a chancroid concealed within the vulva, the secretion of which may inoculate the leech-bites, and give rise to troublesome sores. Hence if leeches be employed, they should be applied to the upper part of the groins or hypogastric region, where the discharge is not likely to reach, and their bites should be protected by an application of collodion or by cauterization with nitrate of silver.[1]

Baths and Lotions.—A hot bath, repeated once or twice a day during the acute stage, is very grateful to the feelings of the patient, and beneficial in equalizing the circulation and relieving the local inflammation; and immersion of the whole body is to be preferred to hip-baths.

Meanwhile, the external genital organs should be frequently bathed with some emollient lotion, and a piece of lint soaked in the same be inserted between the labia, in order to separate the inflamed surfaces and absorb the discharge. The following is an excellent formula for this purpose:—

℞. Decocti papaveris 8 pts.
Liquoris plumbi subacetat. dilut. 1 pt.
M.

Sedatives, of which Dover's, or Tully's powder is perhaps the best, should be administered at night to induce sleep, and also at intervals during the day, if the pain is severe, or the patient nervous and irritable.

The above measures are the only ones admissible during the acute stage of the disease, especially if the vulva is involved; in which case the insertion of an enema tube is too painful to admit of injections. When, however, the inflammation is chiefly confined to the vagina, the lotion just mentioned may be injected into this canal every few hours, and in many cases of a subacute type, injections may be used from the very commencement. As soon as the sensibility of the parts will permit, it is also desirable to introduce a speculum, and ascertain if any ulcer be present.

The kind of syringe used, and the mode of injecting, are matters of no little importance. The small metallic or glass instruments in common use are entirely inadequate for the removal of the discharge. The astringent ingredients of the first portion of fluid injected are

[1] Ricord, Leçons Cliniques, Gaz. des Hôpitaux, 1846, p. 157.

spent in coagulating the purulent matter collected in the vagina. To wash away the coagula thus formed, and exert a medicinal effect upon the mucous membrane, the quantity of the injection should not be less than a pint. A pump syringe, or better still, one of Davidson's or Mattson's syringes, made of India rubber and provided with metallic valves, will enable the patient to inject any desired quantity with one introduction of the tube. While using the injection, the patient should lie on her back, with the pelvis elevated; if she merely stoop down, the fluid escapes as fast as it is injected, and fails to reach the deeper portions of the canal. By means of a bed-pan the wetting of the floor and clothes may be avoided.

As a general rule, injections of greater strength may be used for women than for men, and for the sake of cheapness and convenience, they are commonly made more simple in their composition. The patient may be supplied with the solid ingredients, and allowed to mix them as required, and in order to avoid the expense of having them put up by the druggist in divided portions ready for use, it is desirable, among the poor, to supply them in bulk. A little instruction from the surgeon will enable the patient to measure them out with sufficient accuracy. A heaping teaspoonful, or, in other words, as much as can possibly be taken up by a teaspoon, of the more common ingredients of injections, is nearly as follows:—

Alum ʒij.
Sulphate of zinc ʒij.
Acetate of zinc ʒiss.
Subacetate of lead ʒiij.
Tannin ʒss.

From one to two drachms of either of these salts to the pint of water, is the average strength employed, but the ratio should always be proportioned to the effect produced, and the sensibility of the parts. Whenever severe or long-continued pain is induced, the strength of the solution should be at once diminished, and afterwards increased, as the tenderness becomes less. I would repeat what I have said with reference to injections for men, that young practitioners often lose time, to the neglect of more important matters, in frequently changing from one form to another; cases, however, occur, in which one injection appears to lose its effect, and another may be substituted with advantage, but no change should be made, unless it is evident that the unsatisfactory result is not due to a faulty method of using the syringe, or to constitutional causes,

or again, unless the solution, however diluted, excites severe pain and uneasiness.

When the subsidence of the more acute symptoms first permits the introduction of an enema tube, a drachm of alum may be dissolved in a pint of flaxseed tea, and injected warm, but the temperature should be gradually lowered, and the injection ultimately used cold. Injections of cold water alone, during the chronic stage of vaginitis, are of great value. They not only cleanse the parts, but exert a tonic influence upon the vagina and neighboring organs. Their effect, however, is increased by the addition of alum, or the other salts above mentioned. They should be employed from two to three times a day, but must be omitted, for obvious reasons, during the menstrual periods.

A combination of tannin and alum, as recommended by Dr. Tyler Smith,[1] is also an excellent form of injection, and one which I have prescribed with much success. The proportions are ʒss–j of tannin, and ʒij of alum to the pint of water. Tannate of alumina is formed by chemical decomposition. It should be recollected, however, that tannin, and the salts which contain it, stain the linen almost as indelibly as nitrate of silver, which is a serious objection with many women to its use. I have also employed injections of the sulphate and acetate of zinc, and subacetate of lead, with satisfactory results. Labarraque's solution of chlorinated soda, diluted with from eight to twelve parts of water, may be injected, when the discharge is very offensive. A solution of chloride of zinc, of the strength of from one to three grains to the ounce of water, is a favorite injection with some surgeons.

The following formula, intended as a substitute for the aromatic wine of the French Pharmacopœia, is one of the best injections for general use:—

℞. Claret wine,
Compound spirits of lavender, āā ℥v.
Tincture of opium ℥ss.
Water ℥iijss.
Tannin ʒj—℥j.
M.

I usually direct the patient to add two tablespoonfuls of this mixture to a tumblerful of water, and to gradually increase the strength.

I rarely prescribe a solution of nitrate of silver for the patient's own employment, but frequently myself apply it to the vaginal

[1] Pathology and Treatment of Leucorrhœa, p. 183.

walls, by first introducing a glass speculum as far as the cervix uteri, and then pouring a few drachms through the instrument. If the speculum be slowly withdrawn, the fluid will come in contact with the whole extent of the vagina. I regard this method as one of special value, for if the patient lie on her back with the pelvis well elevated, and if the speculum be as large as the parts will admit, the force of gravity carries the solution into every recess of the dilated vagina, and insures its thorough application to this canal, and also, in a measure, to the cavity of the cervix. The parts should be thoroughly cleansed with copious injections of simple water, before the speculum is introduced. In this manner, a solution of nitrate of silver, containing ℈j–iij to the ounce, may be applied by the surgeon every third or fourth day, and the patient at the same time use some mild astringent injection twice a day.

An application of the solid nitrate of silver crayon, a favorite method of treatment among French surgeons, is requisite in some cases which do not improve under a solution of the same salt. The deepest folds of the vagina should be exposed by means of a bivalve speculum, and the caustic applied to the mucous membrane covering the cervix, and to that of the vaginal walls, as they are brought into view by the gradual withdrawal of the instrument. The compound tincture of iodine, pencilled over the surface, with a camel's-hair brush attached to a long handle, is sometimes preferable to the lunar caustic.

The contact of purulent matter with the mucous membrane of the genital organs is doubtless a constant source of irritation, and is probably sufficient to account for some of the superficial abrasions and other lesions, revealed by a specular examination. The collection and retention of pus upon the external integument will soon excoriate the surface, and, with still greater reason, may it be supposed to act thus upon the more delicate mucous membrane. The abrasions, once formed, increase the quantity of the discharge by their own secretion, and thus the two react upon each other, and prolong the disease. The evil is easily remedied in balanitis and vulvitis by interposing between the inflamed surfaces some porous material, capable of absorbing the discharge as fast as it is secreted, and wet, if desired, with an astringent lotion, which will exert a constant medicinal effect upon the mucous membrane. The same result may be attained in vaginits, and has even been attempted in gonorrhœa of the cervix.[1] For this purpose a folded piece of lint

[1] Hourmann, du Tamponnement, comme Méthode de Traitement des Écoulements Utéro-vaginaux. Journal des Connaissances Medico-Chirurg., Mars, 1841, p. 89.

is sometimes used, but a plumasseau of charpie or carded cotton is preferable, since it retains its elasticity to a greater degree, and is a better absorbent. To facilitate its withdrawal, a small string may be previously attached to it. The size of this tampon must be proportioned to the dimensions of the vagina in each case, and will vary in diameter from half an inch to two inches. In some instances, it is medicated; in others, not. In the former case, the medicinal substance may be an absorbent or astringent powder, as prepared chalk, subnitrate of bismuth, calamine, tannin, powdered alum, etc.; or, it may consist of any of the lotions which have been recommended for the purposes of injections either in the male or female. Calamine and powdered alum are the best dry preparations, and a solution of tannin in glycerin (ʒj–ij ad ℥j) an excellent fluid astringent. The plug may be inserted by the surgeon through a speculum, or the patient may be taught to introduce it with her finger, or by means of a stylet. It should be withdrawn at the end of twelve hours, the vagina washed out with a copious injection, and a fresh plug introduced, or the latter may be deferred till the following day.

Scanzoni employs a plug of cotton wool, sprinkled with alum powder, either pure or mixed with one or two parts of sugar. Pure alum is liable, on the second or third application, to excite a very disagreeable sensation of heat and constriction in the vagina, rendering it necessary to suspend the treatment for a week or two; hence it is not to be used undiluted, unless the parts are quite insensible; and on this account, therefore, it will be best to try, in the majority of cases, a mixture of alum and sugar. The plug, thus prepared, should not be used oftener than every second or third day, nor be allowed to remain in longer than twelve hours, and warm water should be injected immediately on its withdrawal. If these precautions be neglected, acute inflammation of a troublesome character may be excited, and the discharge augmented instead of diminished.[1]

Demarquay recommends a plug moistened with a solution of one part of tannin in four parts of glycerin. His directions are: first to subdue the inflammatory symptoms of the acute stage by appropriate regimen, baths, and frequent emollient injections; next as soon as a speculum can be introduced, to inject simple water in large quantities, so as to remove all secretion from the vaginal walls, which are afterwards to be dried by means of swabs; and, finally, to introduce

[1] Op. cit., p. 456.

plugs of charpie saturated with the mixture of tannin and glycerin. On the following day, the patient should take a bath, the plugs be removed, the injections repeated, and fresh plugs introduced. M. Demarquay states that he has never found it necessary to renew these applications more than four or five times. After discontinuing them, astringent injections, consisting of an infusion of walnut leaves, in which one drachm of alum to the quart has been dissolved, should be used two or three times a day for a week or ten days.[1] The active principle of the infusion of walnut leaves, recommended by M. Demarquay, is tannin, and a convenient substitute may be found in a solution of alum and this vegetable acid in simple water, according to the formula previously given.

Thiry exposes the vaginal walls with a speculum; cauterizes the surface, if much inflamed, with solid nitrate of silver; then sprinkles over it finely powdered charcoal or cinchona, and introduces a tampon of cotton wool, which he allows to remain from three to five hours.[2]

Simpson, of Edinburgh, has proposed an efficacious mode of keeping an astringent in constant contact with the vaginal walls, by means of pessaries, prepared according to the following formulæ:—

℞. Acidi tannici ℈ij.
Ceræ albæ ℈v.
Axungiæ ʒvi.
Misce, et divide in Pessos quatuor.

℞. Aluminis ʒj.
Pulveris catechu ʒj.
Ceræ flavæ ʒj.
Axungiæ ʒvss.
Misce, et divide in Pessos quatuor.[3]

Hip-baths, taken every morning on rising or in the early part of the day, are valuable adjuvants in the treatment of chronic vaginitis. The temperature of the bath should be determined in part by the season of the year, and in part by the strength and habits of the patient. It is well to commence with lukewarm water, and gradually lower the temperature as the system becomes accustomed to them; but they should never be so cold nor continued so long, that the patient feels chilly for some time after their employment, and reaction should be promoted by friction with a coarse towel, flesh-

[1] Bulletin de Thérapeutique, tome i., p. 541.
[2] Journal de Méd. de Bruxelles, Fev. 1854.
[3] Edinburgh Monthly Journal, June, 1848, and Obstetric Works, p. 98.

brush or hair-mitten. These baths may be rendered still more effectual by the addition of a handful of coarse salt to each bucket of water used. Astringents, as alum, in the proportion of half a pound to each bath, are also recommended by some authors.

The *hygienic management* of the case should always receive special attention in chronic vaginitis. As the inflammatory symptoms of the acute stage subside, the patient may be allowed a more generous diet and greater freedom of motion, but she should still avoid violent or prolonged exercise, and especially all sexual excitement. Walking and even standing for any length of time should be but moderately practised at this stage of the affection. No absolute rules can be laid down for diet, which should be adapted to each individual case. In general, the food should be plain and simple, and yet sufficiently nourishing, and the meals should be taken at regular hours. Highly seasoned dishes, pastry, and meats, cheese and strong tea and coffee, should be forbidden; and bread, eggs, fresh meat once a day, vegetables, and simple puddings, recommended. Regularity of the bowels should be secured, if necessary, by small doses of saline cathartics, taken on rising in the morning; and, in brief, all such measures should be adopted, as are calculated to bring the general health to the best possible condition. The latter rule implies that the system should neither be stimulated above, nor depressed below, the happy mean; yet, at the same time, there are but few cases of chronic vaginitis which do not require some support, and in which either mineral acids, preparations of iron, vegetable tonics, quinine, or even stimulants, are not, at some period, indicated. There is really no inconsistency in pulling down with one hand, and, at the same time, building up with the other; in applying leeches, for instance, to the cervix, and unloading the pelvic vessels by cathartics, while tonics are given to elevate the general tone of the system. Such a course must often be pursued, especially with corpulent women of sedentary habits, whose condition, in spite of their apparent excess of health, is in reality below par. I would refer the reader to the chapter on gleet, for much that has reference to the hygienic management of chronic vaginitis, which is in fact the analogue of gleet in man. In both of these affections, constitutional and local treatment must proceed hand in hand, if any permanently good result is to be attained.

The formulæ for various tonics, already given when treating of this disease in the male sex, are equally applicable to the female. The only one which I would add at present is the following old, but excellent combination of a tonic, cathartic, and astringent. Its

cheapness recommends it especially for the poorer class of patients, while for those in better circumstances a more palatable substitute may be found in Seidlitz powders or citrate of magnesia, taken on rising from bed, and in the French *dragées* of iron administered just before or after meals.

℞. Magnesiæ sulphatis ℥iss.
Ferri sulphatis ℈ij.
Acidi sulphurici gtt. x.
Infusionis gentianæ comp. ℥j.
M.
A tablespoonful three times a day.

In *gonorrhœa of the vulva* lotions may be applied with great facility, and the parts separated by the interposition of lint or charpie. Cauterization with the solid nitrate of silver or a solution of this salt is often beneficial. Resolution of a commencing abscess of the vulvo-vaginal gland or duct may sometimes be obtained by rest, cathartics, and antiphlogistic regimen, assisted, in some cases, by the application of leeches to some adjacent part. If suppuration takes place, the abscess should be opened without delay. Ricord and Vidal advise making the incision upon the external surface of the labium, to avoid the admission of the urine and discharges, which would irritate the cavity of the abscess and prevent its healing. An incision in this situation, however, fails to prevent a spontaneous opening on the mucous surface, where the abscess naturally tends to point.[1] By making a small incision on the internal and inferior aspect of the tumor, and directing the knife somewhat upwards so that the cut shall be valvular, and also by allowing the abscess to evacuate itself by the contraction of its walls without the exercise of pressure, the entrance of foreign matter may generally be prevented. In case the abscess repeatedly recurs, its exact seat should be carefully ascertained. If it occupy the duct, it should be laid open by a free incision, and the cavity filled up with lint. If it be seated in the gland, this must be dissected out. I have tried, in several instances, to cure these abscesses by the introduction of a seton, but have always failed.

Whenever, after an attack of vulvitis, there still remains a purulent discharge from the vulvo-vaginal duct, and also in the cases described by Dr. Salmon in which this part is primarily affected, a solution of nitrate of silver may be injected by means of Anel's syringe.

[1] Huguier, op. cit., p. 343.

In *gonorrhœa of the uterus*, the os should be dilated if necessary by means of sponge tents, and the cavity of the cervix and body of the uterus be freely cauterized with the solid nitrate of silver. A crayon of this salt may be passed up with forceps into the uterine cavity; or the extremity of a uterine sound or Lente's probe[1] may be coated with the nitrate melted over a spirit-lamp, and be made to sweep over the whole affected surface. No danger need be feared even if the crayon of the nitrate should break, and a portion be left within the uterus. The application should be repeated every third or fourth day, and astringent vaginal injections be still continued. *Intra-uterine injections are never admissible*, as they have repeatedly been fatal.

Whenever, in gonorrhœa of the vagina or uterus, the cervix is found enlarged and congested, from four to six leeches may be applied. They are especially applicable at the outset of the treatment, and may require to be repeated once or twice at intervals of a week; but the patient should not be debilitated by their frequent use. The surgeon should apply them himself, taking care to plug the cervix beforehand, that they may not fasten upon the sensitive membrane of its internal surface. If the flow of blood is excessive it may be arrested by cold injections of a solution of alum.

The acute stage of *urethritis* is of so short duration as to demand but little special treatment. In most cases, the measures adopted for the concomitant inflammation of the vulva, vagina, or uterus, aided, perhaps, by the administration of alkalies, neutral salts, or sedatives, are sufficient to effect a decided amelioration, and often the entire disappearance of the disease. When this result fails to be attained, I do not hesitate to resort to injections, as in urethral gonorrhœa in men; but as they cannot be used by the patient, it is necessary for the surgeon to administer them himself. Their active principle may be one of the salts of lead or zinc, or tannin; or from one to two drachms of a solution of nitrate of silver, containing ten or twenty grains to the ounce, may be thrown in. If, in this case, we carefully guard against having the bladder entirely empty, no evil result need be feared. Cullerier, in gonorrhœa of the female urethra, does not hesitate to cauterize the whole length of the canal by means of a crayon of nitrate of silver sufficiently large to distend the passage.[2]

[1] A new Uterine Porte-Caustique, by FRED. D. LENTE, M.D.; American Med. Times, Sept. 26, 1863.

[2] Des Affections Blennorrhagiques, p. 58.

Copaiba and cubebs may also be employed in this affection, administered in the manner directed for men. Ricord's experiments have shown that their effect in gonorrhœa of any portion of the genital organs not traversed by the urine is so slight that they are not to be recommended in vaginitis or vulvitis. Indeed, they can readily be dispensed with in all forms of gonorrhœa in women.

CHAPTER X.

GONORRHŒAL OPHTHALMIA.

GONORRHŒAL ophthalmia has been supposed to originate in three ways—from inoculation, from metastasis, and from sympathy, each of which has from time to time been received by certain authors as its exclusive mode of origin.

The occurrence of gonorrhœal ophthalmia from inoculation or contagion, cannot, at the present day, be called in question. Numerous cases reported by Mackenzie, by Lawrence, and by nearly every modern writer on diseases of the eye, leave no room to doubt that the discharge of gonorrhœa applied to the ocular conjunctiva, may set up a severe and destructive form of inflammation, similar to if not identical with purulent conjunctivitis. But, besides these reports of cases in which the inoculation has been the result of accident, farther proof is to be found in the treatment of pannus—employed of late years chiefly by French and German surgeons—in which the eyes have been intentionally inoculated with the pus of gonorrhœa. Discharges from the genital organs have been transferred to eyes affected with pannus, with the express design of exciting acute inflammation, which, it was hoped, might cure the chronic disease; and, however questionable may have been the results of this practice, so far as the accomplishment of the latter purpose is concerned, there has been, at all events, no difficulty in producing acute inflammation by such inoculation. With these facts before us, therefore, no farther doubt of gonorrhœal ophthalmia from contagion is admissible; indeed, direct inoculation is now regarded by all surgeons, with but few exceptions, as the only mode in which originates that destructive form of conjunctivitis which sometimes attends gonorrhœa.

The idea of a metastatic origin of gonorrhœal ophthalmia was first advanced by Saint Yves, who was acquainted with no other mode, as appears from his chapter, "Of the Venereal Ophthalmy,"[1]

[1] A New Treatise of the Diseases of the Eyes, by M. De St. Yves, Surgeon Oculist of the Company of Paris, translated from the original French by J. Stockton, M.D., London, 1741, p. 168.

which is so short, quaint, and interesting, that I shall quote it *in extenso:* "This tenth species of ophthalmy has almost the same signs with the precedent ('the most dangerous ophthalmy, called chemosis'), with this difference that the conjunctiva, which is swelled, appears hard and fleshy. It begins thus: a great quantity of whitish matter with a yellowish cast, oozes constantly through the eye. This disease, which proceeds from a venereal cause, is very rare; yet I have seen several attacked with it. In most of them, this disease appeared two days after the beginning of a virulent gonorrhœa; the matter, not running off by its usual passages, was removed to the eye, through which there flowed a like matter, which stained the linen in the same manner as when it passed through the usual channels."

Gonorrhœal ophthalmia from metastasis, as here stated, implies a translation of the disease from the genital organs to the eye; and, to prove its existence, it would be necessary to produce unquestionable instances in which the urethral discharge has suddenly subsided or disappeared prior to the inflammation of the ocular tunics. But few cases, however, at all likely to fulfil these conditions, have been adduced, and even these few have been of such doubtful character, that the idea of a metastatic origin of gonorrhœal ophthalmia is at the present day almost entirely abandoned.

Still, numerous instances are on record of disease of the eye accompanying gonorrhœa, in which the circumstances of the case preclude the admission of direct inoculation, and in which the symptoms and course of the ophthalmia are decidedly different from those of gonorrhœal ophthalmia from contagion. While discarding the term metastatic as applied to these cases, many surgeons have given them the name of *sympathetic;* rather as a convenient expression, however, than as really explaining their mode of origin. In the next chapter I shall endeavor to show that all those cases which have been termed metastatic and sympathetic gonorrhœal ophthalmia, are merely a manifestation of gonorrhœal rheumatism, which, like ordinary rheumatism, may attack several of the ocular tissues. At present, I shall consider gonorrhœal ophthalmia originating in contagion, and allied to purulent conjunctivitis.

FREQUENCY.—Gonorrhœal ophthalmia, compared with the frequency of gonorrhœa, is a rare affection. The following table exhibits the number of cases received at the N. Y. Eye Infirmary

during a period of fifteen consecutive years, and the proportion which these cases bear to the whole number of patients.

Year.	Whole Number of Patients.	Cases of Gonorrhœal Ophthalmia.
1845	1866	2
1846	1245	3
1847	1485	2
1848	1815	5
1849	1902	3
1850	2082	3
1851	2472	6
1852	2732	7
1853	2719	5
1854	2685	6
1855	2652	5
1856	2634	4
1857	3216	3
1858	3908	2
1859	4171	3
Total	37,034	59

It thus appears that, compared with the whole number of diseases of the eye treated at this institution, cases of gonorrhœal ophthalmia are only as 1 to 628. We have no statistics by which to determine the exact ratio of this disease to the whole number of cases of gonorrhœa; yet I think the experience of every physician would lead him to infer that it is not much greater than to diseases of the eye, since gonorrhœa must be nearly as frequent as all ocular affections combined.

Causes.—The contagious matter which has produced acute inflammation of the conjunctiva in a given case, may have been derived from the genital organs or from the opposite eye—already affected with gonorrhœal ophthalmia—of the same, or from those of another person. An opinion, originating with Mr. Vetch,[1] prevailed at one time, that the pus of gonorrhœa was innocuous when applied to the eye of the individual secreting it. This surgeon drew this conclusion from several unsuccessful attempts which he made to inoculate the urethræ of persons suffering from gonorrhœal ophthalmia with their conjunctival discharge, in the hope of "diverting the disease from the eye to the urethra." At the same time he succeeded in producing urethritis in another patient by applying to his meatus matter taken from the eye of another. The results of these experiments, however, have been proved to be worthless, and

[1] A Practical Treatise on the Diseases of the Eye. London, 1820.

the fact is now well established, that the source from which the matter is derived does not influence its power of contagion. In many of the reported cases of this disease, the ophthalmia was produced by patients washing their eyes with their own urine, with which gonorrhœal pus was mixed, or by otherwise applying the discharges from their own persons.

The personal habits of those affected with gonorrhœa, and the degree of intimacy existing between members of the same household, will, in a great measure, determine the frequency of infection. Among the poor and squalid, where cleanliness is neglected and the same vessels and towels are used in common, gonorrhœal ophthalmia may readily be communicated from one individual to another, until it has attacked all the members of the same family.

Ricord states that he has never seen gonorrhœal ophthalmia produced by discharges from any portion of the genital organs except the urethra; and that he has never known it to be caused by the pus of balanitis or vaginitis. There is reason to believe, however, that a simply vaginal discharge is capable of exciting the disease under consideration.

It is a well established fact that "ophthalmia neonatorum" is frequently caused by inoculation of the infant's eyes with leucorrhœal discharges from the mother. I have repeatedly seen severe purulent conjunctivitis in very young girls, who were affected with that form of vaginitis which sometimes attacks children, independently of contagion, and which has been so ably treated of by Mr. Wilde, of Dublin. Analogous cases are reported in treatises on diseases of the eye, and Dr. Jüngken mentions one instance, in which the ophthalmia, originating in this manner, spread to seven members of a family.[1]

I know of no authentic case of gonorrhœal ophthalmia occasioned by the pus of balanitis. Matter from a venereal or ordinary abscess must also be regarded as generally innocuous. Yet it is, perhaps, impossible to determine with accuracy the limits within which purulent matter is capable of exciting severe inflammation of the conjunctiva. The predisposition of the person exposed will doubtless have no small influence upon the effect produced. Still, so far as at present known, these limits are confined to the urethra and vagina.

The inoculations which have been employed in the treatment of pannus, will throw some light upon the conditions under which contagion may be supposed to take place. The puriform matter used in these inoculations has been derived either from the genital

[1] Annales d'Oculistique, 8e série, t. 1er, p. 355.

organs, or from an eye affected with gonorrhœal ophthalmia, or ophthalmia neonatorum. When such matter is kept from contact with the air, it is found to retain its contagious property for about sixty hours. If exposed to the air, and allowed to dry, it soon becomes innocuous. In the experiments of M. Piringer, of Gratz, a piece of linen was moistened with gonorrhœal matter, and allowed to dry; the cloth was then rubbed upon the eyes of several persons, and no inoculation ensued. The dried matter scraped from the cloth, and applied directly upon the conjunctiva, took effect within about thirty-six hours after it was first obtained. Matter, once dried and immediately moistened again, either by the addition of water or by contact with the secretions of the eye, was found to be contagious. Fresh matter was contagious, even when diluted with one hundred parts of water.

Van Roosbroeck experimented with the pus of a common abscess, and found that it was innocuous when applied to the eye. This surgeon was also led to the conclusion that the discharge from an eye affected with purulent ophthalmia, diluted with water, retains its power of contagion until decomposition has begun to take place, as shown by its evolving the odor of putrefaction.

When the inoculation is successful, no disagreeable sensation is at first excited by the application of the matter; and no effect is perceived until after the lapse of from six to thirty hours, when the eye begins to feel hot, and there is an increase in the ocular secretions, which are at first entirely mucous, but soon become mucopurulent.

Gonorrhœal ophthalmia is much more common in men than in women. Ricord ascribes this difference to the greater frequency of urethritis in the male, this being the only form of gonorrhœa, capable, as he supposes, of occasioning gonorrhœal ophthalmia. I have already dissented from this opinion of Ricord, and I believe that so far as any explanation can be given of the difference in the relative frequency of its occurrence in the two sexes, it must be based upon their different habits.

Symptoms.—Gonorrhœal ophthalmia may occur at any stage of an attack of gonorrhœa, although it is said to be more frequent during the decline. The urethral or vaginal discharge is doubtless most contagious when most purulent, which is during the acute stage, but the short duration of this stage affords less opportunity for it to be applied to the eye than the longer stage of decline. At first, the disease usually attacks one eye alone. It may remain con-

fined to this eye, but not unfrequently, after the lapse of a few days, the opposite eye becomes implicated.

The symptoms of gonorrhœal ophthalmia are, in the main, identical with those of purulent conjunctivitis. The former disease, however, is more rapid in its development, and even more destructive to sight than the latter.

The earliest indications of an attack of this disease are an itching sensation just within or on the margins of the lids, a feeling as if some foreign body were in the eye, and an increase in the ocular secretions. The latter retain at the outset their normal transparency, although they appear unusually viscid; the ciliæ become adherent and glued together, and a collection of dried mucus may be seen at the inner canthus. As the disease progresses, the vessels underlying the conjunctiva become distended with blood. They may at first be distinguished from each other as in simple conjunctivitis, but they are soon lost in a uniform red appearance of the globe, extending as far as the cornea; which retains its normal transparency. The conjunctiva is also found to be somewhat elevated above the sclerotica by an effusion of serum, and its surface is roughened by the development of its papillæ. Meanwhile, the discharge has become purulent, and is secreted abundantly from the inflamed surfaces.

An attack of gonorrhœal ophthalmia is so rapid in its progress, that the early symptoms just now described may have passed away before the first visit of the surgeon, who is often called to see his patient only after the full development of the disease. He probably finds him sitting up, his head bent forwards, his chin resting on his breast, and his handkerchief applied to his cheek to absorb the discharge, which irritates the surface upon which it flows. The eyelids are swollen, especially the upper, which slightly overlaps the lower, and is of a reddish or even dusky hue. The patient states that he is unable to open the eye. His inability to do so is caused less by an intolerance of light, than by the mechanical obstruction which the swelling of the lids occasions, and by the pain which is excited by any friction of the inflamed surfaces upon each other.

The surgeon now moistens the edges of the lids with a rag dipped in warm water in order to facilitate their separation, and proceeds with his examination. In his attempt to open the eye, he is careful not to make pressure upon the globe, in order to avoid giving unnecessary pain, and also, lest the cornea, if already ulcerated, may be ruptured, and the contents of the globe escape. With one finger placed just below the eye, he slides the integument downwards over

the malar bone, and thus everts the lower lid; the upper lid being elevated by a similar manœuvre with the other finger of the same hand applied below the edge of the orbit; or, again, he may expose the globe by seizing the lashes of the upper lid with the thumb and finger and drawing the lid forwards and upwards. All this may be accomplished with the left hand, the right being left free to wipe away the discharge, or to make applications to the eye.

As soon as the lids are separated, a quantity of thick, yellowish pus wells up between them and partially obstructs the view; the swollen palpebral conjunctiva, compressed by the spasmodic action of the orbicularis muscle, may also project in folds. The collection of matter is now removed with a soft, moist sponge or rag, and the surface of the ocular conjunctiva exposed. This membrane is found to be of a uniform red color, with its vessels undistinguishable from each other, and elevated above the sclerotica by an effusion of serum and fibrin in the cellular tissue beneath it. This swelling of the conjunctiva is seen to terminate at the margin of a central depression occupying the position of the cornea, and filled with a collection of the less fluid constituents of the puriform discharge, which may at first sight be mistaken for the *débris* of a disorganized cornea. On removing this matter, however, the latter structure may still be found clear and transparent, at the bottom of the depression, where it is overlapped by the swollen conjunctiva. In less fortunate cases, it may have become hazy from the infiltration of pus between its layers, or ulceration may have already commenced. If an ulcer is not evident on first inspection, it may often be discovered at the margin of the cornea by gently pushing to one side the overlapping fold of conjunctiva. Meanwhile, the secretion of pus is constantly going on and requires repeated removal. It is astonishing to observe how large a quantity of this fluid can be secreted by so limited a surface. This secretion has been estimated at more than three ounces per day.

The amount of pain, occasioned by this disease, varies in different cases. During the development and acme of the inflammation, it is generally severe. It is described by the patient as a sensation of burning heat and tension in the eyeball, radiating to the brow and temple. The system at large sympathizes with the local disease. For a time there may be general febrile excitement, but symptoms of depression soon appear; the pulse becomes rapid and irritable, the skin cold and clammy, and the patient anxious and nervous. This depression of the vital powers is not invariably met with, but is the most frequent condition of the patient, after the disease has

continued for a few days; and it may occur even at an earlier period when the health has been previously impaired by any cause.

Notwithstanding the severity of the symptoms, resolution is still possible. Under proper care and treatment, the inflammatory action may abate, and the tissues recover their normal condition, leaving the eye as sound as before the attack. So fortunate a result, however, is more to be hoped for than confidently anticipated. The chances of success are greater when the case is seen at an early period, before the effusion beneath the conjunctiva has been rendered firm by a deposit of fibrin, or before ulceration of the cornea has commenced. The latter is the chief danger to be feared. Ulceration usually commences at the margin of the cornea, and may extend around its circumference, or advance towards its centre. It is in some cases superficial; in others, it penetrates through the whole thickness of the cornea, and prolapse of the iris ensues, or more or less of the contents of the globe escapes. Sometimes a portion or the whole of the corneal membrane becomes disorganized, and comes away *en masse*. The eye has been known to be destroyed in this manner within twenty-four hours after the first symptoms of the disease were observed, and this catastrophe is said to have occurred in a single night, in a case at the New York Hospital. The escape of the aqueous humor, and other contents of the globe, is usually followed by an amelioration of the pain, and the patient often entertains the hope that he is improving, while the surgeon knows that his sight is irretrievably lost.

The amount of permanent injury inflicted upon the eye will depend upon the extent and situation of the ulceration. When the latter has been superficial, and situated near the margin of the cornea, the resulting opacity will not interfere with vision, and even when the leucoma is central, an operation for artificial pupil is still practicable, if any portion of the cornea remain clear. Perforation of the anterior chamber and prolapse of the iris, when partial, may also be remedied by art; but when the whole, or the larger portion of the cornea has sloughed away, and the prolapsed iris has become covered with a dense layer of fibrin, forming an extensive staphyloma, the case is hopeless.

Diagnosis.—Independently of the history of the case, we have no means of distinguishing gonorrhœal ophthalmia from severe purulent conjunctivitis. It has been asserted that the former commences in inflammation of the ocular conjunctiva, while the latter first affects the lining membrane of the lids. Even if this were true, it would

afford but little assistance in the diagnosis, since we are rarely enabled to watch the early symptoms.

Dr. Hairion,[1] Professor of Ophthalmology at the University of Louvain, supposed he had discovered a diagnostic sign of gonorrhœal ophthalmia in the presence of a bubo in front of the ear; but as no one else ever saw such buboes in this disease, the statement must be regarded as a sad instance of obliquity of vision produced by preconceived notions as to the nature of the disease.

TREATMENT.—In undertaking the treatment of a case of gonorrhœal ophthalmia, it is of the first importance that the patient be intrusted to the care of an intelligent, careful, and faithful nurse, whose whole time and attention can be devoted to carrying out the surgeon's directions. This disease is so rapid in its progress, that neglect for a few hours only may prove fatal to vision; if the eye be saved, a large share of the credit will be due to the faithfulness of the attendant. It hardly need be said that the light touch and gentle hand of a devoted woman should be secured, if possible.

The directions of the surgeon should vary according to the stage of the disease. If the inflammation has commenced within a few hours only, and has not as yet attained its height, from four to six leeches may be applied near the external canthus of the affected eye, or a number of them be made to attach themselves to the mucous membrane of the corresponding nostril. If leeches are not at hand, cups to the temples will suffice. Such local depletion may generally be repeated with benefit, for a day or two, once or twice in the twenty-four hours, especially if the patient be of full habit. If, however, the disease progresses unchecked, and especially if there be any symptoms of general depression of the system, even this slight abstraction of blood should be avoided. It is adapted only to the early stage of the inflammation, and, at a later period, is useless, if not positively injurious.

A free purge should be administered, as, for example, five grains of calomel followed by half an ounce of castor oil, a full dose of Epsom salts, or three "compound cathartic pills." With regard to the diet of the patient, much will depend upon his general condition. As a general rule at this early stage, it should be light, consisting of gruel, broths, etc.; at the same time it is important to recollect the tendency in this disease to depression of the vital powers, and to be governed by the indications of each individual case.

[1] Annales d'Oculistique, t. xv., p. 159.

Lastly, but by no means of least importance, the directions which will presently be given for the frequent cleansing of the eye, should be insisted on, and a collyrium of nitrate of silver, ten grains to the ounce, should be dropped between the lids every two hours, or every hour in threatening cases.

The treatment above recommended is intended for the early stage of gonorrhœal ophthalmia, before much chemosis, swelling of the lids, or other severe symptoms have set in. In most cases, however, as already stated, the surgeon does not see his patient till the disease has attained its height, when some modification of the above treatment is required.

Leeches and cups can now rarely be used to advantage. At the best, they will be impotent to stay the progress of the inflammation. Cathartics should be given as in the first stage,[1] and one or two free evacuations from the bowels secured each day. Here again the general condition of the patient will in a measure determine the diet to be recommended; but in the great majority of cases nourishment should be administered as freely as the appetite will admit, and may consist of bread, milk, beef-tea, steaks, mutton, eggs, etc. When the patient is unable to eat, and especially if his skin is found to be cool and his pulse irritable, or again, if ulceration of the cornea has already commenced, we must resort to stimulants and tonics. These are almost always required in this stage of the disease in hospital practice, where patients are generally more or less cachectic, and even in private practice the subjects of gonorrhœal ophthalmia are often run down by an irregular course of life. Nothing will so much contribute to hasten destructive ulceration of the cornea as a low state of the vital powers. The least indication of this condition should be met by quinine, ale, porter, wine, or milk-punch, freely administered.

The room occupied by the patient should, if possible, be spacious, dry, and well ventilated. The eyes may be protected from a glare of light by the position of the patient, or by a pasteboard shade, or by curtains; but the room should not be entirely darkened, as the complete exclusion of light favors congestion of the eye. With still stronger reason, should the eyes be uncovered and kept free from poultices, alum-curds, tea-leaves, raw oysters, or similar applications, which are often recommended by some officious acquaintance. No surer way of destroying the sight could be devised than by using these articles.

[1] When the disease has already made considerable progress before the surgeon is called, an active cathartic, as croton oil, should be selected.

When chemosis has already taken place, no time should be lost in dividing the conjunctiva and the subjacent cellular tissue by means of a scarificator, bistoury, or scissors, and the operation should be repeated once or more frequently during the twenty-four hours, so long as the chemosis continues. The late Mr. Tyrrell advised radiated incisions between the courses of the recti muscles, on the supposition that ulceration of the cornea was due to constriction of the conjunctival vessels exercised by the chemosis, which it was desirable to relieve without cutting off the vascular supply by dividing the larger vessels. Experience, however, has shown that his theory was incorrect, and that as much benefit accrues from simply snipping the conjunctiva and underlying cellular tissue wherever it is puffed up by infiltration, and promoting the flow of blood by the application of warm water. Within half an hour after the blood has ceased to flow, the whole inflamed surface should be freed from pus and brushed over with a camel's-hair pencil dipped in a solution of nitrate of silver containing forty to sixty grains to the ounce, or the solid crayon may be applied, taking care to remove the residue by a free application of tepid water afterwards.

At the first visit, also, the attendant, who is to take charge of the case, should be instructed as to her duties, and the importance of her faithfully performing them. She should be made to look on while the surgeon goes through the process of opening and cleansing the eye, and be taught to follow his example. A syringe is sometimes recommended for the purpose of removing the pus. There are, however, two objections to the employment of this instrument: in the first place, unless used with gentleness, the force of the stream irritates the inflamed and sensitive conjunctiva; and, again, the injected fluid, mixed with contagious matter, may be reflected back, and strike the eye of the attendant or fall upon the opposite eye of the patient. Several cases are recorded in which this accident has occurred. For these reasons a soft rag is to be preferred, and this, again, is better than a sponge, because it is more cleanly and may be frequently changed. By squeezing the fluid from the rag upon the adherent portions of the discharge, or by gently touching them with a free fold of the cloth projecting beyond the fingers, they can readily be detached. Simple tepid water may be used for these ablutions, but I prefer a solution of alum, of the strength of a drachm to the pint. The nurse should be directed to repeat them every hour or every half hour, according to the severity of the case, and the patient may be furnished with a cupful of the solution to bathe the external surface of the eye and wash away the discharge, still more fre-

quently. Cleanliness may be still farther promoted by cutting off the ciliæ, so as to prevent their becoming incrusted with matter; and by smearing the edges of the lids with simple cerate.

The strong solution of nitrate of silver, already mentioned, may be reapplied by the surgeon twice a day when he makes his visits, but, meanwhile, a weaker solution of the same salt, containing ten grains to the ounce, should be dropped into the eye, after it is thoroughly cleansed, every two or three hours. The frequency, however, of the application should depend upon the condition of the parts and the effect produced. No routine practice is admissible. The patient must not be deprived of sleep by too frequent repetition of these measures during the night, but he should be provided with a watcher, who will cleanse the eye and apply the solution of nitrate of silver every few hours. If necessary, sleep must be promoted by the administration of an opiate.

The time has gone by, when mercurials were thought requisite in this disease, on account of its supposed syphilitic origin. The only circumstance which can justify their employment is the presence of a firm, fleshy chemosis, which, owing to its consistency, cannot be relieved by incisions. In such cases, mercurials may perhaps hasten the absorption of the fibrinous deposit; but they should be used with great caution, especially when ulceration of the cornea has already commenced, and should never be pushed to salivation. An excellent formula, combining the "gray powder" with quinine, is the following:—

℞. Hydrarg. cum cretâ gr. ij.
Quiniæ sulphatis gr. j–iv.
Misce et ft. pulv.

One to be taken morning and night.

When only one eye is affected, the greatest care should be taken to avoid inoculation of the other by allowing the discharge to come in contact with it. On the slightest indication of inflammation in the latter, the weaker solution of nitrate of silver should be applied to it, as frequently as to the eye first affected.

When there is excessive œdema of the lids, it may interfere with opening the eye and cause pressure upon the globe; in which case relief may be given by puncturing the skin in several places with a lancet. Division of the external canthus, in order to facilitate the exposure of the inflamed conjunctiva, has been recommended by Mr. France[1] and others, but it is not generally required.

[1] Guy's Hospital Reports, third series, vol. iii.

As the symptoms improve, the stronger solution of nitrate of silver may be omitted, and the weaker applied less frequently. When the chief danger is passed, the collyrium may often be changed with benefit, and one of the following substituted:—

℞. Zinci sulphatis gr. ij.
Glycerin ʒij.
Vini opii ʒj.
Aquæ ʒv.
M.

℞. Acidi gallici gr. x.
Glycerin ʒiij.
Vini opii ʒij.
Aquæ camphoræ q. s. ad ℥iv.
M.

A pleasant method of employing these collyria is by means of an eye-cup. I have met with cases in which a solution of nitrate of silver appeared to irritate the eye, and in which the above collyria were found preferable even in the acute stage of the disease.

The occurrence of an ulcer upon the cornea is of serious moment, and the friends of the patient should be informed of the danger to vision.

The progress of the ulcer may sometimes be arrested by gently touching its surface with a stick of nitrate of silver, the point of which has been rounded off and somewhat sharpened by rubbing it upon a wet rag; or a saturated solution of the same salt may be applied with a fine camel's-hair pencil. The whitening of the surface which follows the application will indicate whether the whole of the ulcer has been touched. At the same time the pupil should be dilated by dropping a solution of atropine upon the globe several times a day, or by smearing extract of belladonna, moistened with glycerin, around the orbit. The former is much more cleanly. The usual strength of the solution employed is two grains to the ounce. The object of thus dilating the pupil is to diminish the prolapse of the iris if the ulcer should penetrate through the cornea, and, if possible, to prevent the pupil's becoming involved in the resulting synechia. The chances of accomplishing this are not very great, for a pupil dilated by mydriatics contracts as soon as the aqueous humor escapes, as is seen during the operation of extraction for cataract; still, as the evacuation of the contents of the anterior chamber in perforating ulcer of the cornea is often sudden, some hope may be entertained of limiting the prolapse. I would again remind the

reader of the importance of avoiding antiphlogistic remedies and of the necessity of supporting the strength, when the cornea, a tissue of low vitality, is attacked by the ulcerative process. Cupping, leeching, low diet, and mercurialization will be sure to hasten destruction of the eye, which can only be saved, if saved at all, by generous living, stimulants, and tonics.

A granular condition of the palpebral conjunctiva is frequently left after an attack of gonorrhœal ophthalmia, and may keep up a slight discharge and irritation of the eye for a considerable time. The best means for its removal consists in the application of a crystal of sulphate of copper to the everted lids every second or third day; and the general system should, at the same time, be supported by fresh air, good diet, and tonics.

When a staphyloma has formed, its friction against the lids is often a source of irritation to the affected eye, and, through sympathy, to its fellow. If it is small, there may be hope of its contracting and being less prominent, as the fibrin covering it becomes more firmly organized; and it may be pencilled over daily with a strong solution of nitrate of silver with a view of favoring this result. When, however, it has already attained considerable size, and covers so large a portion of the cornea that there is no chance of the eye serving as an organ of vision in future, it is useless to make any farther attempts to save the eye, especially as its inflamed condition endangers the integrity of its fellow, and the intraocular pressure will probably still farther increase the size of the staphyloma, until it bursts of itself or is relieved by art. Two operations are available under these circumstances: one, the ordinary excision of the staphylomatous projection and sinking of the eye; the other, extirpation of the globe by the modern or Bonnet's method.

The former is to be preferred, as a general rule, in cases of staphylomata following gonorrhœal ophthalmia, because the staphyloma is usually limited to the cornea, and the deeper tissues of the eye are commonly, though not always, sound. Moreover, the mobility of an artificial eye is greater when worn upon a sunken globe, than when the latter is removed; and, again, patients, through ignorance of the simple modern operation for extirpation, are very averse to its performance. At the same time, it should be recollected that a sunken eye, especially when irritated by wearing a glass substitute, may at any future period become inflamed and endanger the integrity of its fellow through sympathy. After the removal of a staphyloma, therefore, patients should always be warned of this

danger, and cautioned to seek advice at once, if ever the stump should become inflamed, or the sight of the fellow eye should begin to fail.[1]

The operation for removing a staphyloma is too well known to require description here. There is only one point to which I desire to call attention. After the operation, the lids should be closed by strips of isinglass plaster and remain so until the wound has entirely healed; otherwise the friction of the lids and the exposure of the hyaloid membrane to the air, will be likely to set up inflammation in the deeper tissues of the eye and cause much suffering.

Extirpation of the globe should be preferred, when internal or general ophthalmia has supervened; when the staphyloma includes not only the cornea but a portion of the sclerotica; or when hemorrhage has taken place from the bottom of the eye, either on the perforation of the anterior chamber, on the bursting of the staphyloma, or during an operation for its removal. The blood, in these cases, comes chiefly from the choroidal vessels; its flow may be arrested, but the clot can only be eliminated by the slow and tedious process of suppuration, and it is better to remove the eye at once.

The modern operation for extirpation of the globe is exceedingly simple. The ball of the eye is alone removed, while the remaining contents of the orbit are left. The instruments required are a pair of toothed forceps, blunt-pointed straight scissors, and a strabismus hook. The eye should be kept open with a wire speculum. The conjunctiva and underlying fascia are divided close around the margin of the cornea, and the tendons of the four recti muscles hooked up and severed as in an operation for strabismus. The scissors are then passed in behind the globe and the optic nerve cut at its point of entrance, when the ball may readily be removed, after dividing the oblique muscles and any remaining points of attachment. There is no danger of subsequent hemorrhage. The lids may be allowed to close, and the clot which forms within them is the best hemostatic for such cases. If the operation has been well performed, without extending the incisions beyond the ocular fascia, the wound will heal with great rapidity. I have frequently been

[1] Calcareous deposit is very liable to take place in sunken globes which have become the seat of chronic inflammation, and in such cases it is impossible to relieve the irritation except by extirpation. I have this day removed the stump of an eye, destroyed by granular conjunctivitis, in a boy aged 16, in which I found a plate of calcareous matter the size of a three cent piece.

able to insert an artificial eye on the third or fourth day after the operation.[1]

The remedies recommended in the preceding pages for gonorrhœal ophthalmia may be recapitulated, in the order of their importance, as follows: cleanliness, frequent application of an astringent solution, nourishment, and, in most cases, stimulants and tonics, incisions of the chemosed conjunctiva, cathartics, and local depletion. This plan of treatment differs widely from the copious and repeated venesections, the low diet, and the free administration of mercurials and tartar emetic, prescribed by nearly all writers on this affection until within a very few years. If the practice which I have advised were new, it might be requisite to say something farther in its defence; but its claims have already been established by most of the eminent authorities of what may be called the modern school of ophthalmic surgery. When supported by the writings and practice of such men as Prof. Graves,[2] Critchett,[3] Bowman, Wilde, Dixon,[4] France,[5] Hancock,[6] and others, both in this country and abroad, it is unnecessary to say anything farther in its favor. I will only add that my own experience, drawn from the largest infirmary for diseases of the eye in this country, perfectly coincides with that of the authors above mentioned.[7]

In the words of Mr. Dixon: "The student ought constantly to bear in mind that, although the disease termed purulent ophthalmia has received its name from that symptom which readily attracts notice, namely, the profuse conjunctival discharge, the real source of danger lies in the *cornea;* and that, even if it were possible so to drain the patient of blood as materially to lessen or even wholly

[1] It would be out of place in this work to enter more fully into the details of this and other operations which may be required after gonorrhœal ophthalmia. For farther particulars with reference to extirpation of the globe, the reader is referred to an essay by Mr. Critchett, in the London Lancet (Am. ed.), Jan., 1856; also to papers by Dr. C. R. Agnew and by the author, in the N. Y. Journal of Med., Jan. and May, 1859.

[2] London Medical Gaz., vol. i., 1838–9, p. 361.

[3] Lectures on Diseases of the Eye, London Lancet (Am. ed.), Aug. 1854.

[4] Guide to the Practical Study of Diseases of the Eye. London, 1859.

[5] Op. cit. [6] London Lancet, Nov. 1859.

[7] Dr. O'Halloran appears to have been one of the first to discard the old depletive treatment of purulent ophthalmia. In his "Practical Remarks on Acute and Chronic Ophthalmia, and on Remittent Fever" (London, 1824), he says: "I am of opinion that if any inquiry be instituted amongst the army surgeons, it will be found that those who used the greatest depletion were the least successful practitioners, and that sloughing, ulcers, &c., more frequently succeeded the evacuating plan than when the patient was partly left to nature."

arrest the discharge, we might still fail to save the eye. It is not the flow of pus or mucus, however abundant, that should make us anxious, but the uncertainty as to whether the vitality of the cornea be sufficient to resist the changes which threaten its transparency. These changes are two-fold—*rapid ulceration* and *sloughing*. Now, has any sound surgeon ever recommended excessive general bleeding and salivation as a means of averting these morbid changes from any other part of the body except the eye? And if not, why are all the principles which guide our treatment of other organs to be thrown aside as soon as it attacks the organ of vision?"

CHAPTER XI.

GONORRHŒAL RHEUMATISM.

GONORRHŒAL rheumatism was first recognized by Swediaur, who described it under the name of "Arthrocele, Gonocele, or Blennorrhagic Swelling of the Knee."[1] Since Swediaur's time, this disease has received particular attention from various writers on venereal and diseases of the joints, among whom Sir Benjamin Brodie,[2] Sir Astley Cooper,[3] Ricord,[4] Bonnet, of Lyon,[5] Foucart,[6] Brandes,[7] and Rollet,[8] are especially worthy of mention. During this period, however, gonorrhœal rheumatism has by no means been allowed to retain its place in the nosological system undisturbed, and there have been many who have attempted to explain it away, on various hypotheses. Its claims to be considered a distinct complication of gonorrhœa will appear in the course of this chapter.

To an observer who had never heard of the connection between gonorrhœa and rheumatism, it might indeed appear a mere coincidence, if a patient suffering from gonorrhœa should suddenly be seized with inflammation of the joints; but should this same patient, after entirely recovering from both affections, and after several years of perfect health, again contract gonorrhœa, and again be seized with articular rheumatism, the occurrence would be sufficiently remarkable to excite a suspicion in the mind of the most careless observer that there was some connection between the two. Let this second attack be followed by a third, fourth, and fifth, and the sus-

[1] A Complete Treatise on the Symptoms, etc., of Syphilis, by F. Swediaur, M. D. Translated from the fourth French edition, by Thomas T. Hewson. Philada., 1815, p. 108.

[2] Brodie's Select Surgical Works: Diseases of the Joints. Philada., 1847.

[3] Lectures on the Principles and Practice of Surgery. London, 1835, p. 482.

[4] Notes to Hunter, 2d ed. Philada., 1859, p. 275.

[5] Traité des Maladies Articulaires. Paris, 1853, t. i. p. 376.

[6] Quelques Considerations pour servir à l'Histoire de l'Arthrite Blennorrhagique; in 8vo., pp. 45. Bordeaux, 1846.

[7] Archives Générales de Médicine, Sept., 1854.

[8] Annuaire de la Syphilis; année 1858, Lyon.

picion would be converted into a very strong probability. Suppose that numerous other patients were met with in whom these two affections thus repeatedly coexisted, an attack of gonorrhœa in each of them being followed by one of rheumatism, with such certainty that the latter might be predicted immediately on the appearance of the former, and a manifest relation between the two diseases could no longer be doubted. Now, this repetition of these two diseases in the same person is not merely hypothetical—it is a reality; and it is observed in subjects entirely free from any rheumatic diathesis, who have inflammation of the joints at no other time than when they have gonorrhœa. Among the many cases which might be cited, none perhaps will better illustrate this point than the following, which I quote from the lectures of Sir Astley Cooper:—

"I will give you," says this distinguished surgeon, "the history of the first case I ever met with; it made a strong impression on my mind. An American gentleman came to me with a gonorrhœa, and after he had told me his story, I smiled, and said: do so and so (particularizing the treatment), and that he would soon be better; but the gentleman stopped me, and said, 'Not so fast, sir; a gonorrhœa with me is not to be made so light of—it is no trifle; for, in a short time you will find me with inflammation of the eyes, and in a few days, I shall have rheumatism in the joints; I do not say this from the experience of one gonorrhœa only, but from that of two, and on each occasion I was affected in the same manner.' I begged him to be careful to prevent any gonorrhœal matter coming in contact with the eyes, which he said he would. Three days after this I called on him, and he said, 'Now you may observe what I told you a day or two ago is true.' He had a green shade on and had ophthalmia in each eye; I desired him to keep in a dark room, to take active aperients, and apply leeches to the temples. In three days more he sent for me, rather earlier than usual, for a pain in one of his knees; it was stiff and inflamed; I ordered some applications, and soon after the other knee became inflamed in a similar manner. The ophthalmia was with great difficulty cured, and the rheumatism continued many weeks afterwards."

Similar cases are related by nearly every author who has written on this affection, and, further on, many are given in a table of the diseases of the eye which accompany gonorrhœal rheumatism. M. Rollet relates in detail five such instances occurring in his own practice, and this repetition took place in eight of thirty-four cases reported by Brandes, of Copenhagen, and in three of eight cases observed by M. Diday. According to Rollet's researches, this repe-

tition has been noted in nearly one-quarter of the total number of cases of gonorrhœal rheumatism which have been published.

The frequency of cases like these can leave no doubt in the mind that a close relation exists between these two affections, and additional evidence is found in the fact that the rheumatism attendant upon gonorrhœa presents certain peculiarities, which, in general, are sufficient to distinguish it from the ordinary forms of rheumatism.

CAUSES.—In comparison with the great frequency of gonorrhœa, gonorrhœal rheumatism is exceedingly rare. Very little is known of the causes which occasion it in the few, while the many affected with gonorrhœa escape. Its occurrence might naturally be attributed to a rheumatic diathesis, especially as the fact is well established that persons subject to rheumatism are particularly prone to contract gonorrhœa; and it is distinctly asserted by several writers that a constitutional tendency to rheumatism is a predisposing cause of inflammation of the joints during an attack of gonorrhœa. There is reason to believe, however, that the plausibility of this opinion, founded on *à priori* reasoning, has given it greater weight than it deserves. Those who have expressed it, have failed to produce any evidence in its support; and if we examine the published cases of this disease, we frequently find it noted that the patient never suffered from rheumatism except when he had gonorrhœa. M. Rollet has made this point a special subject of inquiry, and states that in the great majority of cases of gonorrhœal rheumatism which have come under his observation, there was no rheumatic diathesis either in the patients or in their parents. He also states that he has had under treatment many patients with gonorrhœa who were predisposed to rheumatism, and yet in them, urethritis has not been attended by any inflammation of the joints; and this fact derives additional weight from the frequency with which gonorrhœal rheumatism, after having once occurred, is re-excited by a subsequent clap. These statements of M. Rollet go far to show that a rheumatic diathesis has no part in the production of gonorrhœal rheumatism; it is desirable, however, that this point should be subjected to further observation.[1]

[1] M. Rollet weakens his position by asserting an antagonism between a rheumatic diathesis and gonorrhœa, in virtue of which, he believes that a clap sometimes cures a patient of a tendency to rheumatism, from which he has previously suffered for years! He says that he has observed one such case, and quotes another in detail which occurred in the practice of M. Diday; but surely it is more reasonable to suppose that the disappearance of the rheumatism in these two cases was a mere coincidence.

The exciting cause of gonorrhœal rheumatism cannot be found in the use of copaiba and cubebs, as has been sometimes asserted, or in exposure to cold and sudden changes of temperature. Inflammation of the joints has frequently been known to occur in patients who have taken neither of these drugs, and who have been confined to the wards of a hospital during the whole course of their attack of gonorrhœa. On the other hand, how frequently are copaiba and cubebs administered for gonorrhœa, and how often must the subjects of clap be exposed to cold and moisture, and yet how rare is gonorrhœal rheumatism!

The phenomena of gonorrhœal rheumatism are also inconsistent with the idea of a metastasis from the urethra to the joints, since in most cases there is an exacerbation of the urethral discharge preceding the articular inflammation. This is especially noticeable in chronic cases of gleet, in which gonorrhœal rheumatism supervenes.

The influence of sex in the production of gonorrhœal rheumatism cannot be questioned. All the undoubted cases of this disease that have been published relate to men, and it must be extremely rare, if it exists at all, in women.[1] Ricord, Vidal, Cullerier, and a few other writers admit that it is occasionally met with in women, but have not reported their cases, if they have observed any.

It will be seen from the above remarks how imperfect is our knowledge of the etiology of this disease, and it would be useless to enter into any farther speculations upon the subject.[2]

[1] Foucart says: "I have not been able to find a single case of gonorrhœal rheumatism in the female, either in special treatises on this subject or in the medical journals."

Brandes says: "The cases of gonorrhœal rheumatism in women reported by a few authors are far from conclusive. My own attention has been fixed on this point for six years, during which time I have not been able to find a single case at the only hospital in Copenhagen where venereal diseases in women are treated."

Two very questionable cases are reported as occurring in the service of M. Rayer in 1846, the only account of which is as follows: "One woman was affected with inflammation of the elbow joint during the course of an attack of vaginitis. Another had nearly all the joints of the extremities slightly and successively inflamed, after several attacks of vaginal discharge." (Rollet.)

Another questionable case is related by MM. Blatin and Nivet (Traité des Maladies des Femmes).

[2] Rollet is inclined to believe that an explanation of the origin of gonorrhœal rheumatism is to be sought for in the seat of gonorrhœa. He says: "There is no difficulty in admitting that when gonorrhœa extends to certain tissues or portions of the urethra, as yet undetermined, it may, in subjects constitutionally predisposed to this disease, excite inflammation of the joints."

SEAT.—None of the joints are exempt from an attack of gonorrhœal rheumatism, but this disease affects the knee far more frequently than any other joint. The following table exhibits the order of frequency with which the various joints were affected in 81 cases observed by MM. Foucart, Brandes, and Rollet:—

Articulation of the	knee	64
" "	ankle	30
" "	hips	15
" "	fingers and toes	15
" "	shoulder	10
" "	wrist	10
" "	elbow	8
" "	sternum and clavicle	3
" "	tarsal bones	2
" "	sacrum and ilium	2
" "	lower jaw	1
" "	tibia and fibula	1
		161

Thus in 81 cases 161 joints were affected, and the knee was involved in 64. Besides the joints, gonorrhœal rheumatism frequently affects the ocular tunics; also the bursæ connected with the muscular tendons, especially the tendo-Achillis; and sometimes the sheaths of the muscles, as in muscular rheumatism. Again, Ricord states that he has met with several patients who suffered from severe pain in the plantar region, apparently seated in the fasciæ.

The knee-joint, therefore, is the favorite seat of gonorrhœal rheumatism, though all the joints of the body are liable to its attacks. This disease, however, is less prone to change its seat from one joint to another than ordinary articular rheumatism. This fact is evident from an examination of the above table, which shows that there were but 161 joints affected in 81 cases; an average of about two joints to each case. I know of no similar table exhibiting the number of articulations affected in a given number of cases of ordinary rheumatism, but the proportion is undoubtedly much greater. Again, in 10 of the 19 cases in the above table, furnished by M. Foucart, only one joint was affected; of the 34 cases of M. Brandes's, the rheumatism was mono-articular in 5, and also in 10 of the 28 cases collected by M. Rollet. These facts, therefore, would give us a ratio of about one-third, in which gonorrhœal rheumatism attacks but a single joint, but more extended statistics are required before this proportion is received as accurate.

Even when gonorrhœal rheumatism does not remain confined to

one joint, but extends to others, the articulation first affected does not recover its normal condition, as it often does in ordinary articular rheumatism, but generally continues in a state of inflammation after the disease is lighted up in other joints. In this respect, gonorrhœal rheumatism again differs from acute rheumatism, but approximates to the character of rheumatic gout.

There can be no question, I think, that gonorrhœal rheumatism sometimes attacks the heart, but it is equally certain that this complication is much less frequently met with than in ordinary acute articular rheumatism.[1] Ricord states that in several clearly marked cases of gonorrhœal rheumatism, he has observed symptoms of endocarditis, and also of effusion within the pericardium, but it is to be regretted that he has not given these cases in detail. The rarity of any mention of heart disease, however, in the reported cases of gonorrhœal rheumatism, proves the correctness of the above assertion that this disease is usually free from such complication. The only undoubted case that I am acquainted with is one reported by Mr. Brandes:—

A man, 50 years of age, had had five attacks of gonorrhœa within ten years; each attack being attended with disease of the joints. In a sixth attack he was seized with violent pain and swelling of several joints, especially the knee. A few days after, inflammation of the eye and pericardium ensued. The friction sound was well marked; and the pulsations of the heart were irregular. There was dulness on percussion over a considerable space, with palpitation and pain in the precordial region. These symptoms improved under venesection and mercurials. Meanwhile the iris became inflamed in the right eye, and a week after this eye recovered, the left was attacked. The patient finally recovered, but suffered from weakness of the lower extremities for a long time, so that he was obliged to walk with crutches for several months.

I have also received a verbal report of a similar case occurring in the practice of one of the most reliable surgeons of this city, but the details, drawn only from memory, are not sufficiently full to entitle them to publication.

Ricord is the only authority, so far as I am aware, who has seen any affection of the nervous centres in gonorrhœal rheumatism. This surgeon states that he has met with symptoms of compression of the spinal marrow and of the brain, such as paraplegia and hemiplegia, which appeared to be produced by increased effusion

[1] "I am induced to think that, under ordinary circumstances, some heart affection arises in about half of all cases of acute rheumatism." (*Fuller on Rheumatism.*)

within the serous membranes of the brain and spine, and which followed the same course as the affection of the joints.

No affection of the lungs or pleura has ever been observed in gonorrhœal rheumatism.

Gonorrhœal rheumatism is essentially an hydrarthrosis, and in many instances the inflammation is confined to the synovial membrane of the joint during the whole course of the affection. The predilection of this disease for serous membranes is shown by its attacking the bursæ connected with the tendons, especially about the wrist and ankle. Rollet states that he has seen one case in which the seat of the disease appeared to be a bursa accidentally developed over the acromion process, and Cullerier has met with the same in the bursa in front of the patella.

SYMPTOMS.—In describing the symptoms of gonorrhœal rheumatism, it is desirable to take those of ordinary articular rheumatism as a standard of comparison. Proceeding in this manner, we find that gonorrhœal rheumatism is generally ushered in with less febrile disturbance than its more frequent congener. In some cases there is an entire absence of premonitory symptoms, and the patient's attention is not attracted to the joints until effusion has taken place and motion has thereby been rendered painful and difficult. In other instances, a slight chill and wandering pains have been experienced, before the morbid action has become settled in any one joint; and those cases are exceptional in which the inflammatory symptoms at the outset are comparable in violence to those of acute rheumatism.

When the articular disease is fairly established, the pain is increased and is often severe; but here, also, we find the symptoms less acute, as a general rule, than in ordinary rheumatism. Even in those cases in which the local pain is great, there is much less general febrile excitement; and an examination of the blood drawn in five cases by M. Rollet and in one by M. Foucart, failed to show that buffed and cupped condition of the clot which is so frequently met with in acute rheumatism.

The integument covering the affected joint generally retains its normal color, though it sometimes puts on the blush of inflammation. When the knee-joint is the seat of the disease, as is frequently the case, the symptoms of a serous effusion within the capsule are readily detected. The patella is elevated above the femur and is freely movable; the joint has the form of a cube, the usual depression on either side of the patella being replaced by swellings, and

fluctuation can be detected without difficulty. It is evident that the inflammatory process is confined to the synovial membrane, and that the fibrous and osseous tissues are unaffected. The collection of serum necessarily impairs the mobility of the joint, and pain is excited by pressure or by any attempt at motion. If the disease do not yield readily to treatment, other tissues about the joint become involved, and we may then find redness of the skin, together with fulness of the vessels and a corresponding increase of the pain and general febrile disturbance, assimilating the case to one of acute rheumatism.

Those cases of gonorrhœal rheumatism which commence with the most decided inflammatory symptoms are generally the most amenable to treatment; those, on the contrary, in which the febrile action is but slight, and in which there is but little more than a passive effusion into the synovial sac, are more obstinate.

Recovery, in any case of this disease, can rarely be expected in less than a month or six weeks, and is often delayed for several months or even years, especially when the patient is debilitated and when the affection of the urethra is allowed to run on, or does not yield to treatment.

It is unnecessary to describe the symptoms of the cardiac affection which sometimes complicates a case of gonorrhœal rheumatism, since these do not differ from those of endocarditis and pericarditis attendant upon ordinary acute rheumatism. The inflammation of the eye which frequently precedes or accompanies—or sometimes alternates with the disease of the joints, and which is evidently dependent upon the same condition of the general system, will presently receive special mention.

Most cases of gonorrhœal rheumatism terminate sooner or later in complete resolution, although they may render the patient a cripple for a long period. Suppuration within the bursa very rarely occurs. It is admitted by Ricord, who says, however, that it is always due to some accessory cause of inflammation; and Vidal mentions one case occurring under his charge in which it was necessary to open the joint and evacuate the purulent collection. Anchylosis, especially of the smaller joints, is a more frequent termination of gonorrhœal rheumatism, and in scrofulous subjects, this disease has not unfrequently been followed by that strumous affection of the joints known as "white swelling;" here, as in other well-known instances, a constitutional cachexia selects the weakest part of the body as the seat of its manifestation.

Dr. Holscher[1] reports a case in which death is said to have occurred from gonorrhœal rheumatism. An abscess formed in the affected joint, and purulent infection ensued, terminating fatally.

The period at which rheumatism makes its appearance in the course of a gonorrhœa appears to be more variable than that of epididymitis. Some cases are met with in which the affection of the joints occurs during the acute stage, or first week or two of the duration of the clap; and yet in the majority of cases we find that the rheumatism manifests itself at a later period, when the urethral discharge has passed its climax. Generally, we find that the running has been more copious for a few days preceding the outbreak of the rheumatism, and this is especially noticeable in long-standing cases of clap which have been accompanied by several repetitions of the articular affection, each of which has followed an exacerbation of the discharge. Cases in which the running suddenly diminishes or entirely dries up before the rheumatism appears, must be regarded—in spite of the opposite opinion so frequently expressed—as rare and exceptional, and not sufficient for the basis of a theory of metastasis. In deciding this point—to which much importance has been attached—it should be recollected that if the rheumatism occurs several weeks after contagion, the discharge will probably have somewhat diminished, following the course which it usually pursues in cases entirely free from any complication. After the disease of the joints is established, the running sensibly decreases in most cases, as a consequence of revulsive action. In other instances—estimated by Rollet at about one-third—it remains without much change. It rarely disappears entirely, except as the result of treatment.

Gonorrhœal rheumatism, unlike acute rheumatism, but like rheumatic gout, frequently attacks the eye.[2] The ocular affection in these cases, is that form of "gonorrhœal ophthalmia" which has been described by authors as "metastatic or sympathetic;" but the difference in the mode of origin, symptoms, prognosis, and treatment, between this form of ophthalmia and purulent conjunctivitis arising from contagion, is so great, that it would be desirable to

[1] Annales de Holscher, 1844.

[2] "In true rheumatism, the eye seldom suffers; so seldom, that I find no record of any affection of that organ in more than 4 out of the 379 cases of acute and subacute rheumatism admitted into St. George's Hospital, during the time I held the office of Medical Registrar. But in rheumatic gout, the eye is not unfrequently implicated. It was inflamed in 11 out of the 130 cases of rheumatic gout admitted during the same period; and it has suffered more or less severely in five out of 75 cases, which have fallen under my own care at the hospital." (Fuller.)

distinguish the two by different names, and to drop altogether the term *gonorrhœal ophthalmia*, as applied to that ocular affection which accompanies gonorrhœal rheumatism. But before proceeding to further discussion of this point, it will be interesting and instructive to compare the views of different authors relative to these two diseases.

Mr. Tyrrell[1] denies the existence of gonorrhœal ophthalmia allied to purulent conjunctivitis and arising in any other way than by contagion, but he admits a conjunctivo-sclerotitis, due, as he supposes, to the metastasis of gonorrhœa.

Mackenzie admits gonorrhœal conjunctivitis by contagion, by metastasis and by sympathy, and also a gonorrhœal iritis.

Mr. Lawrence[2] admits three distinct forms of ophthalmic inflammation occurring in conjunction with, or depending on gonorrhœa, viz., 1st. Acute inflammation of the conjunctiva; 2d. Mild inflammation of that membrane,; and 3d. Inflammation of the sclerotic coat, sometimes extending to the iris.

In speaking of the last-mentioned form, Mr. Lawrence says: "This affection of the eye is exactly the same as rheumatic inflammation of the sclerotic and iris, occurring independently of gonorrhœa. Both this and the mild purulent inflammation of the conjunctiva are to be regarded as rheumatic affections of the organ excited by gonorrhœa; that is, they take place in individuals, in whom this constitutional disposition is shown by inflammation affecting either the synovial membranes, or the fibrous structures of the joints. Although the organs seem at first view very dissimilar, there is an analogy of structure between the parts which suffer in the two instances; that is, between the synovial membranes and the conjunctiva, and between the ligaments and fibrous sheaths, and the sclerotica. Hence, we need not be surprised at finding that the eyes suffer under the influence of that unsound state of constitution which leads to these affections of the joints. The structure originally affected, the lining of the urethra, is also a mucous membrane, which sometimes becomes inflamed, and pours out a puriform discharge, in gouty and rheumatic subjects from internal causes."

Ricord admits two kinds of gonorrhœal ophthalmia; one from contagion, the other metastatic or sympathetic; but although he states that the latter may present all the symptoms of the former, yet his description of it differs widely from uncomplicated purulent

[1] Diseases of the Eye, vol. i., p. 387.

[2] On the Venereal Diseases of the Eye, London, 1830.

conjunctivitis. He says: "Not only the conjunctival, but also the sclerotic vessels are injected; the eye appears more tense and more brilliant than natural; the cornea often projects a little more than usual, and the iris is a little farther off; in some instances we may satisfy ourselves that the aqueous humor is increased. At times there are symptoms of iritis, as a change of color in the iris, contraction of the pupil, which is rarely distorted, and more or less photophobia. The aqueous humor may be cloudy, lactescent, or flaky, owing to inflammation of the membrane of Descemet, and false membranes may be formed, which give rise to adhesions, or pseudo-cataracts; but pustules on the iris, or what have been called condylomata of the iris, are never seen as in syphilitic iritis. A process takes place in the eye analogous to what we meet with in the synovial membranes, in cases of gonorrhœal arthritis, which, as I have already stated, sometimes accompanies this ophthalmia, or alternates with it. Sympathetic gonorrhœal ophthalmia, other things being equal, is more irregular in its course, and more subject to relapses than the ophthalmia from contagion. It often changes its seat, which does not occur in the latter." It will be seen that this description covers the symptoms of inflammation of the deeper textures of the eye, especially the sclerotica and iris, rather than those of uncomplicated conjunctivitis; and, in spite of Ricord's subsequent statement that the symptoms of the sympathetic disease may be identical with those of gonorrhœal ophthalmia from contagion, it is evident that he is describing a different affection.

Finally, M. Rollet[1] has taken the ground that sympathetic gonorrhœal ophthalmia is almost always an inflammation of the membrane of Descemet, and that it is invariably a manifestation of gonorrhœal rheumatism. This surgeon calls attention to the fact so frequently noticed by others, that this form of ophthalmia is generally associated with gonorrhœal rheumatism, but he is also inclined to believe that it may exist alone without any affection of the joints, and that as we often have one joint alone attacked by gonorrhœal rheumatism, so the eye may be the only part of the body in which the rheumatic tendency shows itself.

With regard to the seat of this affection, M. Rollet does not deny that it may be in some other of the ocular tunics, but he maintains, that in the great majority of cases, it is in the iris. He goes farther, and asserts that it is the anterior layer of the iris which is attacked by the inflammatory process, which may extend to the posterior lamina

[1] Op. cit.

of the cornea. According to this author, therefore, this affection is an aquo-capsulitis, or, more properly speaking, a kerato-iritis, the symptoms of which are the following: injection of the conjunctival vessels and especially of the zone of sclerotic vessels around the cornea; occasional photophobia and increase in the flow of tears; a nebulous appearance of the cornea; an increase of the aqueous humor; dulness of the iris, and a deposit of plastic material in the anterior chamber (which Mackenzie states is unequalled in degree in any other form of iritis), occasioning great obscuration of vision. Generally both eyes are attacked simultaneously or consecutively. The disease may terminate in resolution, or atresia iridis. It differs from syphilitic iritis, in that the latter affects the substance of the iris, produces a greater change in its color, often gives rise to tubercular excrescences, deforms the pupil to a greater extent, and is more likely to cause adhesions between the iris and anterior capsule of the lens. In the opinion of M. Rollet, the symptoms of gonorrhœal iritis now described are so constant, and so different from the effects of common rheumatism upon the eye, that he regards this affection as one proof that gonorrhœal rheumatism is a distinct species apart from rheumatism produced by other causes.

It thus appears that several authors have recognized the fact that "sympathetic gonorrhœal ophthalmia" is dependent upon the same condition of the general system as gonorrhœal rheumatism. Moreover, in all the cases which I have been able to find recorded, these two diseases have coexisted within a short space of time; the affection of the eye, in all of them, has been either preceded, attended, or followed by rheumatism, and in some instances they have alternated with each other.

Again, the tissues of the eye affected are the same as those usually involved in rheumatic gout, with which gonorrhœal rheumatism has so many other points of resemblance. These considerations are sufficient, I think, to establish the identity of the two diseases, and to authorize the conclusion that the affection of the eye is but one manifestation of gonorrhœal rheumatism. It is no objection to this view that the ophthalmia sometimes precedes the affection of the joints, for the same is true of inflammation of the heart attendant upon acute rheumatism,[1] and we may also admit, that in some cases,

[1] "In summing up the principal facts deserving of notice in reference to rheumatic inflammation of the heart, I should say that it is incidental to all the stages of acute rheumatism, occurring sometimes before the commencement of inflammation of the joints, and possibly, also, in some rare instances, without the concurrence from first to last, of any active articular symptoms." (*Fuller on Rheumatism*, Am. ed., N. Y., 1854, p. 165.)

though I have not met with any such, the disease of the eye is the only evidence of a rheumatic tendency, the joints remaining entirely unaffected.

The present classification of this form of ophthalmia, does away with many difficulties which have heretofore surrounded this subject, and reconciles many discrepancies to be found in books. The "mild gonorrhœal conjunctivitis" of Lawrence, the "gonorrhœal conjunctivo-sclerotitis" of Tyrrell, and the "gonorrhœal iritis" of Mackenzie and others, are seen to be essentially the same disease, dependent upon a rheumatic tendency induced by gonorrhœa, and capable of manifesting itself in any of the external tunics of the eye. The difficulty of admitting a disease of the eye originating in gonorrhœa, otherwise than by contagion, is done away with; it is no longer necessary to call in question the cleanliness of patients, or to suspect constitutional syphilis in the entire absence of proof that such exists; and the obscure phenomena of metastatic and sympathetic gonorrhœal ophthalmia are found to be in accordance with the laws which govern ordinary rheumatic ophthalmia.

In the following table of cases of gonorrhœal rheumatic ophthalmia, I have included all the more noted facts which from time to time have been published by some of the most eminent authorities in our profession. Most of them have been related by their authors as instances of "metastatic or sympathetic gonorrhœal conjunctivitis, iritis," etc. In many cases, the details are very imperfect, and it is very probable that in some the disease of the eye was merely catarrhal ophthalmia coexisting with gonorrhœa, but I have thought it best to make no attempt to sift them, the better to enable the reader to form his own conclusions on the facts at present in our possession. This table includes nearly all the cases which I have been able to find in a somewhat extended search through works on Venereal, and Diseases of the Eye.

REPORTED CASES OF "METASTATIC GONORRHŒAL OPHTHALMIA" SO-CALLED.

1	Brodie's Select Surgical Works; Diseases of the Joints; Phil., 1847, p. 35.	Patient 45. years of age.	Four attacks.	Contracted gonorrhœa in the middle of June, 1817. Rheumatism of foot commenced June 23; ophthalmia June 24; conjunctivæ much inflamed with profuse discharge of pus. Complete recovery. 2d attack in Dec. 1817, similar to preceding, but leaving him crippled. 3d and 4th attacks in March, 1818 and 1822, in which the inflammation was situated in the "proper tunics" of the eye (sclerotica, iris, and choroid).
2	Ibid., p. 36.	Case obscurely reported.	Nine.	In four attacks, purulent ophthalmia; in two, inflammation of the sclerotica and iris; inflammation of various joints and bursæ mucosæ.
3	Ibid., p. 37.	—	Two.	Gonorrhœa in 1809, with swelled testicle, purulent ophthalmia, and inflammation of synovial membranes. Similar attack in 1814, except no swelling of testicle.
4	Ibid., p. 37.	Patient with strictures of urethra.	Four.	In all, the urethritis was the first symptom, and was followed by purulent ophthalmia and inflammation of synovial membranes. In two of these cases, the gonorrhœa was attributed to contagion, and in the two others to the use of bougies.
5	Ibid., p. 38.	Patient ætat. 23.	One.	Purulent discharge from the urethra; inflammation of knee-joint with effusion; slight inflammation of the conjunctiva, which subsided under the use of remedies directed to the rheumatism.
6	Lawrence on the Venereal Diseases of the Eye; London, 1830, p. 104.	John Harley, aged 38, had never had rheumatism before.	One.	One month after appearance of gonorrhœa, was attacked with "acute external inflammation" of both eyes, resulting in extensive ulceration of corneæ and impaired vision; within one week after commencement of ophthalmia, had rheumatism of several joints.
7	Ibid., p. 107.	Gentleman, 52 years of age.	Several.	Slight discharge from the urethra in 1822, which the patient did not attribute to infection, followed by inflammation of conjunctiva, chemosis, and puriform discharge. The eye symptoms disappeared, when rheumatism of one knee and both hands set in: as the latter grew better, the eyes became inflamed again. This attack lasted for two years. The patient was seen again in 1828. No recurrence of acute rheumatism, though the joints were still stiff from old attack. Had had at least six attacks of inflammation of the eyes since former visit, and the contraction of pupils and adhesions to capsule showed that the iris had been involved. No return of urethral discharge.
8	Ibid., p. 111.	Mr. G., ætat. 33, of good constitution; had never suffered from rheumatism.	—	Urethral discharge appeared July 9th, 1827; eyes became inflamed July 23d; symptoms those of simple acute conjunctivitis, without chemosis or profuse purulent discharge. Severe pain in the hip and thigh came on July 24th. Patient improved and was supposed to be well, but had a short relapse of urethral discharge, ophthalmia, and pain in hip, after exposure, Aug. 9th.
9	Ibid., p. 114.	Mr. C., ætat. 38; full liver and subject to rheumatism.	One.	Gonorrhœa followed by inflammation, with effusion of knee and swelling of hands. Symptoms were improving and urethral discharge had ceased, when mild inflammation of the conjunctiva came on in both eyes; this subsided in a few days under the use of tepid lotions.

10	Ibid., p. 115.	Mr. C., ætat. 30, of spare habit and leading a sedentary life.	—	Within a few years after marriage, had four attacks of discharge from the urethra, "without infection." The last of the four attacks was attended with painful swelling of the foot and enlargement of the glands in the groin. Four years afterwards (June, 1827) had an acute attack of aquo-capsulitis in left eye, with copious effusion of lymph in anterior chamber; under treatment these symptoms entirely disappeared. Sept. 7th, contracted gonorrhœa from impure connection. Sept. 18th, mild conjunctivitis ensued in both eyes; and, Sept. 21st, rheumatism of foot and upper extremities, the discharge from the urethra still continuing. In Feb. 1828, he had severe inflammation of the external tunics and iris on both sides; some stiffness of joints still remained; no mention of the urethral discharge.
11	Ibid., p. 118.	Patient of spare habit and good constitution; had always enjoyed good health; age 28.	One.	An attack of gonorrhœa was getting better, when rheumatism of the joints of foot and of the knee appeared, followed in a short time by inflammation of the sclerotica and iris in both eyes, which left permanent adhesions between the iris and anterior capsule.
12	Ibid., p. 120.	Patient 24 years of age, and good constitution.	Two.	1st attack. Patient contracted gonorrhœa, the symptoms of which were very severe. In three weeks, both eyes became "red and inflamed, painful and acutely sensible to light; lachrymation and mucous discharge" (inflammation of the sclerotica and iris). No affection of joints mentioned. 2d attack, occurring 18 months after the preceding. As before, a severe attack of gonorrhœa followed in a fortnight by an attack of conjunctivitis, which disappeared in a few days. About a fortnight after, however, the gonorrhœa still continuing, the eyes again became inflamed; the inflammation being seated in the "deeper tunics." Soon after rheumatism appeared affecting all the joints of the body, but particularly the knee. Patient continued well for about two years, when he had a severe attack of rheumatism without any affection of the eyes.
13	Ibid., p. 123.	Patient aged 25.	One.	Patient had had a slight gonorrhœal discharge for some time, when inflammation of the internal tunics and iris of both eyes ensued, followed in a few days by inflammation of the knee-joint. The eyes recovered in a month, the urethritis and rheumatism still continued for a year afterwards.
14	Ibid., p. 124.	Mr. F., 29 years of age.	One.	Five weeks after the commencement of an attack of gonorrhœa, had severe pains in the back, sides, and lower limbs; after these had continued a fortnight, he had injection of the sclerotic vessels, with profuse lachrymation and dimness of vision.
15	Ibid., p. 127.	Mr. L., 29 years of age.	—	Had an attack of gonorrhœa nine years ago, unaccompanied by any rheumatic affection. Four years ago, had gonorrhœa, followed by rheumatism, which affected particularly the feet. A third attack of gonorrhœa, ten months ago, followed in a week by rheumatism in the feet, which has continued till the present time; meanwhile he has had an attack of sclero-iritis in each eye.
16	Tyrrell, vol. i., p. 387	Patient 46 years of age.	Four.	Gonorrhœa; inflammation of several joints with effusion; inflammation of conjunctiva and sclerotica in both eyes, and in one extending to the iris and choroid. Order of sequence of these affections not given. Other three attacks similar.

17	Ibid., p. 392.	Patient 20 years of age, fair complexion and scrofulous diathesis.	One.	After the acute stage of an attack of gonorrhœa had subsided, inflammation of the synovial capsule of the knee and of the conjunctiva and sclerotica of both eyes.
18	Ibid., p. 394.	—	One.	"Similar to the last case."
19	Ibid., p. 394.	—	One.	Similar to the two previous cases, except that the inflammation extended to the iris and choroid of one eye.
20	Ibid., p. 395.	—	Six or seven.	Each attack was preceded by slight gonorrhœa; no inflammation of synovial membranes, but rheumatic pains about shoulders, arms and neck prior to disease of eyes; inflammation of conjunctiva and sclerotica, dull aching pain in globe and brow aggravated at night, dull condition of iris, irregular pupil, muscæ.
21	Vetch, Practical Treatise on the Diseases of the Eye; London, 1820, p. 243.	Patient 25 years of age.	Two, at five years' interval.	In each attack the subsidence of the gonorrhœa was attended by rheumatism of the knee and joints of foot, followed by inflammation of the sclerotica and iris; irregular and contracted pupil, synechia, opacity of capsule of lens, and impaired vision. There was no chemosis or purulent discharge in either attack. Swelled testicle present in the first.
22	Prof. Graves, London Med. Gaz., new series, vol. i., p. 440.	P., aged 35 years.	Four.	The gonorrhœa in each attack ran its course till the discharge and inflammation began to decline, when the eyes invariably became inflamed, presenting all the symptoms of simple acute conjunctivitis, and after a few days the sclerotica and other tissues became involved. Again, after the ophthalmia had lasted a few days, one of his joints invariably was affected with acute inflammation.
23	Sir Astley Cooper, Lectures on the Principles and Practice of Surgery; London, 1835, p. 482.	—	Three.	An American gentleman applied to Sir Astley Cooper to be treated for gonorrhœa, and told him that in two former attacks he had had inflammation in the eyes, and rheumatism in the joints. Sir Astley cautioned him against allowing any matter from the urethra to come in contact with the eye. Three days after, the man had "ophthalmia" in both eyes, which was cured with great difficulty; and in three days more he had rheumatism in each knee. (It is evident that the disease of the eye in this case was not purulent conjunctivitis.)
24	Rollet, Annuaire de la Syphilis; année 1858, p. 19.	Patient aged 24 years, an inmate of the Venereal Hospital at Lyon.	One.	Inflammation of eyes commenced eight days after gonorrhœa; redness of conjunctivæ, lachrymation, cornea slightly opaque, atresia and irregularity of pupils, circumorbital pains. Inflammation of knee-joint with effusion took place four days after the disease of eyes appeared.
25	Ibid., p. 20.	Patient aged 30; never had rheumatism before.	One.	Disease of the eye appeared eight days after urethral discharge. Left eye only affected; injection of conjunctival vessels; pupil irregular, iris darker than on opposite side; slight opacity within the pupil; pain in the orbital region. Inflammation of joints of knee and foot came on in about seven weeks, the disease of urethra and eye still continuing.
26	Brandes, Arch. Gén. de Méd., Sept. 1854.	—	Two at an interval of three years.	1st attack. The day following the appearance of a gonorrhœa, patient began to suffer from an "ophthalmia" of both eyes and pain in one shoulder. The ophthalmia subsided under treatment. A relapse taking place, several joints were affected with rheumatism, the iris became inflamed, with hypopion.

				2d attack. Ophthalmia appeared in five days, and rheumatism in eight, after gonorrhœa; iris inflamed, several joints involved.
27	Same author	Patient had stricture, and these several attacks were probably not due to fresh contagion.	Five at intervals of one or two years.	Inflammation of the iris, followed by rheumatism, in each attack.

In all the cases included in this table, the eye disease was preceded, attended, or followed by rheumatism. In a majority of the attacks the ophthalmia preceded the rheumatism.

In about two-thirds of the cases of which we have sufficient details to enable us to determine the seat of the ophthalmia, the sclerotica and iris were chiefly affected; in the remaining third, the conjunctiva. In the latter class, it is sometimes noted that there was purulent discharge and chemosis; but the inflammation does not appear to have assumed the severity of gonorrhœal ophthalmia from contagion, since only one (No. 6) terminated in ulceration of the cornea, and most of the cases yielded readily to treatment.

We may conclude, therefore, that gonorrhœal rheumatism, like rheumatic gout, may attack any of the ocular tunics, though it most frequently involves the sclerotica, from which it may extend to the conjunctiva, iris, or other tissues.[1] It must be borne in mind that the vascular connection of all the tissues of the eye is very intimate. and that the inflammatory process is never wholly confined to one portion of the globe. It is highly probable, I think, that many cases of gonorrhœal rheumatic ophthalmia, which have been described as conjunctivitis, have in reality been instances of conjunctivo-sclerotitis, in which the injection of the conjunctival vessels has masked that of the sclerotica. The orbital and circumorbital pain, which are often mentioned, would indicate this. At the same time, it must be confessed, that in some instances the chief seat of the disease has been the conjunctiva, and that the presence of a muco-purulent discharge and a certain degree of chemosis, have rendered these cases readily mistakable for gonorrhœal ophthalmia from contagion. The milder character of the disease, the history and habits of the patient, and the existence of rheumatism, are, in such instances, the chief elements on which to found a diagnosis. When a patient has had an affection of the eyes and joints in previous attacks of gonorrhœa, or when gonorrhœal rheumatism coexists with an oph-

[1] These cases do not confirm ROLLET's statement, that gonorrhœal rheumatic ophthalmia is always a kerato-iritis.

thalmia which does not present the severe symptoms of purulent conjunctivitis, there is a strong probability that it is of the rheumatic form, even though the conjunctiva appears to be chiefly affected. Not unfrequently, also, rheumatic ophthalmia, after entirely disappearing from one eye, involves the opposite eye, or returns a second time to the one first affected, a course never pursued by gonorrhœal ophthalmia from contagion.

In by far the larger proportion of cases, however, as shown by the above table, the symptoms of gonorrhœal rheumatic ophthalmia are those of sclerotitis, iritis, or kerato-iritis, either separate or combined. I shall not attempt to describe the characteristic features of these different forms, since they are identical with those of the same affections arising from other causes.

I will merely remark that when the iris is involved, it generally appears to be so secondarily, and that the inflammation affects it to a less extent and more superficially than in other forms of iritis; hence that there is less danger of adhesions to the capsule of the lens and of atresia iridis, and that tubercular excrescences are probably never seen upon its surface.

DIAGNOSIS.—The admission of gonorrhœal rheumatism as a distinct disease, is by no means dependent upon the question whether it presents any symptoms different from those of ordinary rheumatism. Inflammation of the epididymis, identical with swelling of the testicle attendant upon gonorrhœa, may be excited by other causes; and even if no diagnostic signs of the rheumatism caused by urethritis be admitted, we should still be warranted in using the term "gonorrhœal rheumatism" as indicating the connection between the two diseases.

It is evident, however, that the disease now under consideration differs in some respects both from acute rheumatism and rheumatic gout, though much more closely allied to the latter than to the former.

It differs from acute rheumatism in the absence or slightly marked character of its premonitory symptoms; in the less degree of constitutional disturbance which attends it; in being limited to a few joints; in its predilection for the synovial membranes; in rarely attacking the heart, but frequently the eye; in its persistency; and in seldom affecting women. It differs from rheumatic gout in the fact that hereditary influences, so far as at present proved, have no part in its production; also in the frequency with which it attacks

the knee-joint; in its preference for the male sex, and in its rarely leaving any permanent traces of its invasion.

Whether these points of difference are sufficient or not to constitute a distinct species of rheumatism, is a question which probably cannot be decided with satisfaction to every mind. Even the laws of classification in the animal and vegetable kingdoms are as yet far from being settled; much less can it be said that there are fixed rules for determining how great a degree of difference will justify a distinct species in the natural history of disease. All that we can say with regard to gonorrhœal rheumatism, is, that in well-marked cases, it presents certain characteristic features sufficient to indicate its origin, even when before unknown. In some instances, its symptoms resemble those of other forms of rheumatism so closely that we should not be led to suspect its character, unless aware that the patient was suffering from gonorrhœa.

In a given case of this kind, therefore, it may at times be extremely difficult to determine whether our patient has an affection of the joints dependent upon his urethritis, or whether his rheumatism is simply a coincidence; if, however, there be but little constitutional disturbance; if only a few joints, and particularly the knee, be affected; if the disease be chiefly confined to the synovial membrane—as shown by the articular effusion, and the slight degree of heat and redness externally—and if it exhibit but slight tendency to migrate from one joint to another, then there can be little question that the gonorrhœa and rheumatism bear to each other the relation of cause and effect. The probability will be still further strengthened, if the patient has never been subject to rheumatism; or, *à fortiori*, if he has had it only in conjunction with previous attacks of gonorrhœa.

NATURE.—The power of exciting rheumatism, exercised by gonorrhœa in certain cases, has often been advanced as an argument to prove that the latter disease is a modified form of syphilis; and it has been asserted that the rheumatism is due to the absorption of a specific poison from the urethra. This idea has probably derived additional weight from the supposition that no other satisfactory explanation could be given of the connection between these two diseases, and before such was found, the theory of a syphilitic or gonorrhœal virus was thought to be the only alternative. The question has been asked: If the rheumatism is not produced by the absorption of a specific poison, how is it produced? But such a process of reasoning is founded on a gross over-estimate of our know

ledge of cause and effect in disease. The connection between gonorrhœa and rheumatism is only one of many instances, in which the link which binds two diseases together escapes us, although the union is plain and unquestionable. Who, for instance, can account for the intermittent fever which is sometimes occasioned by a stricture of the urethra; or explain the connection between chorea and rheumatism—a connection so intimate that a large proportion of children who have the one will have the other; or the reason that disease of the supra-renal capsules causes bronzing of the skin? And so throughout the etiology of all diseases, if for a moment we endeavor to divest our minds of the familiarity which daily observation has given to the connection between them and the causes which produce them, in how few instances do we really understand the mechanism of the process!

Facts which occur but rarely, excite wonder; if frequent or coinciding with other known phenomena, the mind receives them without distrust. Is it then an isolated fact that a local affection, entirely destitute of specific properties, is capable of exciting rheumatism? By no means. Dr. Fuller, who believes that the proximate cause of rheumatism is a poison generated in the system (not absorbed from without) as the result of faulty metamorphic action, thus speaks of the influence of local disease: "One part of the animal economy hinges so closely on the other, that local mischief occasions general disturbance, and under certain circumstances appears to induce a state of system favorable to the generation of rheumatic poison; a state of system arising, be it observed, not as a direct and immediate consequence of suspended secretion, but as a sequel of perverted function gradually taken on by the system generally, in consequence of imperfect or morbid local action. Excessive venery and long-continued debauchery are frequently productive of rheumatism, and so is immoderately protracted lactation. The phenomena of gonorrhœa afford an admirable example of how local diseases gradually give rise to general derangement of the system, and so to the production of the peccant matter of rheumatism."[1] This connection between local diseases in general and inflammation of the joints is also fully recognized by other observers; it need not therefore surprise us, nor is there any necessity to suppose the absorption of a specific poison, when we find that rheumatism can be excited by inflammation of the urethra.

Moreover, evidence is not wanting to show that the phenomena

[1] Fuller on Rheumatism, p. 35.

of gonorrhœal rheumatism cannot be explained on the ground that the syphilitic or any other specific poison has been taken into the system from without. In order not to extend this subject to too great length, I will merely enumerate the chief points of this evidence.

1. If gonorrhœal rheumatism were due to the absorption of a virus, it ought to be a very frequent disease, considering the multitude of patients affected with gonorrhœa; it is, however, quite infrequent.

2. On the same supposition, it ought to run a regular and definite course, like specific diseases in general.

3. One attack, also, should afford immunity from, or at least partial protection against subsequent attacks in the same person.

4. No evidence of the absorption of a virus is found in an examination of the lymphatic vessels or ganglia in gonorrhœa, as in syphilis. Even in cases of gonorrhœal rheumatism, the absorbents in the neighborhood of the genital organs retain their normal condition.

5. Gonorrhœal rheumatism has repeatedly been known to occur in connection with urethritis which had been excited by the use of bougies, or by intercourse with women during the menstrual period If it can thus be caused by a simple urethritis, why is it ever necessary to attribute it to a "virulent gonorrhœa?"

6. None of the known symptoms of syphilis bear any more than the slightest resemblance to gonorrhœal rheumatism.

TREATMENT.—It is evident that we cannot deduce the treatment of gonorrhœal rheumatism from that of acute rheumatism, as has sometimes been done by writers on this subject; nor, again, entirely from that of rheumatic gout, although here, it is not improbable that a somewhat similar line of treatment may be found applicable. But if we recognize a special cause and certain peculiarities in the symptoms of gonorrhœal rheumatism, the treatment of this disease demands investigation independent of any preconceived notions derived from our experience with kindred affections.

The amount of constitutional disturbance attending the commencement of an attack of gonorrhœal rheumatism is rarely sufficient to require active antiphlogistic measures. The administration of an emetic, or a free purge, as from five to ten grains of calomel, followed by castor oil or Epsom salts, is commonly sufficient to allay the febrile excitement, and has the additional advantage of correcting the condition of the digestive organs which are usually at fault.

The patient should be kept quiet, and his diet be proportioned to the severity of the febrile action. The chief means of combating the local inflammation is to be found in the abstraction of blood from the neighborhood of the joint. Cups or leeches should be applied, and repeated as often as the case requires. They afford marked relief to the pain, often arrest the progress of the disease, and hasten its resolution.

After the more acute symptoms have been subdued, or even at the outset, when the disease is from the first of a subacute character, the greatest benefit will be derived from blisters. These are especially applicable, when a large joint, like the knee, is attacked, and when an effusion within the capsule is a prominent symptom. The vesicated surface may be dressed with simple cerate with the addition of five grains of morphine to each ounce, and so soon as the surface heals a fresh blister may be applied. If strangury ensue, the daily application of strong tincture of iodine may be substituted for the unguentum lyttæ. Velpeau recommends that the joint be kept constantly smeared with mercurial ointment, to which some preparation of opium has been added.

Ricord and some other writers advise the internal administration of colchicum, alkalies, and the salts of potash, as in rheumatism dependent upon other causes, but the reports of cases in which these remedies have been employed are far from proving their efficacy. The occasional use of an emetic or purge has in the hands of several surgeons been found to be of decided advantage. Rollet speaks highly of vapor baths. Copaiba and cubebs have no effect upon the rheumatism, and can only be required for the urethritis, which, in most cases, however, is more satisfactorily treated by local measures.

Meanwhile, the treatment of the urethral discharge on which the rheumatism depends, should not be neglected. Unless this be entirely arrested, there is always danger of a relapse. In many of the cases reported, the rheumatism has repeatedly returned at intervals of several months, so long as the exciting cause continued. The measures already recommended for the treatment of gonorrhœa and gleet should, therefore, be actively employed, at the same time that attention is paid to the affection of the joints.

When gonorrhœal rheumatism occurs in persons of broken-down constitution, or when the general health becomes impaired by the continuance of the urethral and articular disease, it is necessary to resort to hygienic measures, and frequently to the administration of tonics, as preparations of iron, iodine, cod-liver oil, bark, etc. These remedies, together with fresh air and good diet, should by no means

be neglected, as soon as the patient is found to be debilitated. Barwell believes that gonorrhœal rheumatism depends upon slight purulent infection, and recommends large doses of quinine.

A very efficacious method of treating the swelling which often remains after the acute symptoms have subsided, is by means of strips of adhesive plaster so applied as to exercise compression and at the same time render the joint immovable. Supposing the knee to be affected, the limb should be bandaged from the toes up to the point where the plaster is to commence, or just below the swelling. The strips should be of about two fingers' breadth, and each one, first passed behind the limb, be brought round in front, and its ends made to cross like the letter X. One strip after another is applied, each overlapping the preceding for about one-third its width, until the whole joint is covered, when four or five additional layers are superposed in the same manner, in order to insure a sufficient degree of stiffness, and the whole enveloped in a bandage. I can speak very decidedly of the good effects of this application in this and other chronic affections of the joints.

When the eye becomes inflamed, local depletion by means of leeches or cups to the temples should be resorted to. If the conjunctiva be involved, the strictest cleanliness should be maintained by frequent bathing with tepid water. Astringent collyria are less frequently called for than in conjunctivitis independent of any rheumatic taint; if used, their effect should be carefully watched, and, if they fail to afford relief, they should be omitted. When the iris is implicated, the pupil must be dilated by atropine, and mercurials administered as in other forms of iritis.

CHAPTER XII.

VEGETATIONS.

VEGETATIONS are papillary growths springing from the skin or mucous membrane chiefly in the neighborhood of the genital organs, and identical in their nature with the warts which are so common upon the hands. They are not, strictly speaking, venereal, since they are not necessarily connected with either of the diseases originating in sexual intercourse. It is true that they are most frequently observed in men and women who have been affected with gonorrhœa, balanitis, chancroids, or syphilis; but this is simply because the skin or mucous membrane has for a time been moistened with an acrid secretion which has favored the abnormal development of its papillæ. They are found in young children, with regard to whose purity there can be no suspicion; and also in adults who have never suffered from any venereal disease whatsoever. Again, they are not unfrequently met with during pregnancy; the increased secretion from the vagina and the determination of the blood to the pelvis at this time being highly favorable to their development.

The importance of these growths has been very much exaggerated. Thus, they have been regarded as syphilitic, and as an indication of the necessity of specific remedies; and this, too, in spite of the generally recognized fact that mercury has no effect whatever in their removal. Their only connection with syphilis is when they spring from the surface of a chancre, mucous patch, or other general lesion, upon which they are a merely accidental formation. The sore which serves as their base may require a mercurial course, but the superadded vegetation in itself presents no such indication.

Again, it is often said that they are contagious; and some semblance of truth for this supposition has been found in the fact that when situated upon one of two opposed surfaces, as the labia or upper and inner parts of the thighs, similar growths not unfrequently spring up upon the opposite; and somewhat doubtful cases have been reported in which, as alleged, vegetations have appeared upon men after connection with women who were similarly affected. But,

such instances are readily explained on the ground that the acrid secretion from vegetations, when applied to neighboring parts, and possibly, when transferred to another individual, acts in the manner already explained, and gives rise to others. The very fact that their supposed contagion takes place upon the person affected, is sufficient to prove that they are not dependent upon the virus of true syphilis, the lesions of which are not auto-inoculable; and there is no reason whatever for ascribing them to the poison of the chancroid. Moreover, they present the same aspect, follow the same course, and are amenable to the same treatment, when occurring in young children and pregnant women who are otherwise healthy, as in persons affected with venereal diseases.

Several varieties of vegetations have been admitted, especially by the French, founded upon their resemblance to various objects in nature. Thus, Alibert, who believed that vegetations were syphilitic, admitted them as one of three principal forms of the syphilodermata; and divided them into six varieties: "La syphilis végétante framboisée;" "en choux fleurs;" "en crêtes;" "en poireaux;" and "en verrues;" to which he added the truly syphilitic lesion, mucous patches, under the head of "condylomes."

No useful purpose, however, is attained by this classification, which serves only to confuse the mind; since the form of vegetations is solely dependent upon accidental circumstances, as their position and the pressure of neighboring parts. It is sufficient to know that they are sometimes flat and but little elevated above the surface; while at others they are attached by means of a pedicle of variable diameter; and that they are chiefly developed in whatever direction they meet with the least resistance. When exposed to the air they are often dry and hard; when protected by an opposed surface, they are soft and smeared with a highly offensive secretion.

Their microscopical appearances are thus described by Lebert: "A feeble power shows their internal vascular structure and numerous sebaceous follicles about their base. With a high power, the papillæ appear to be composed of an outer rind consisting of concentric layers, and of an internal substance; the two differ from each other only in density; for, besides their vascular element, they consist only of epidermic cells. In the outer layers, these cells are more densely packed and present a longer and narrower outline, which, at first sight, gives them a fibrous appearance. The internal portion is also composed of epidermic cells in close juxtaposition, but round and finely dotted on their surface. Vegetations are nothing else than a development of the papillæ of the epidermis,

and, in their anatomical composition, do not differ much from certain papilliform warts."

Vegetations are most frequently met with upon the internal surface of the prepuce directly back of the furrow at the base of the glans; they are also found upon the margin of the meatus, or within this orifice upon the walls of the fossa navicularis; upon the vulva in women, and especially in the neighborhood of the carunculæ myrtiformes; and, in both sexes, around the anus, upon the tongue, velum palati, and even within the larynx.

TREATMENT.—The treatment of vegetations consists simply in their removal by the knife, caustic, or ligature, and the destruction of the base from which they spring. With the vegetations upon the internal surface of the prepuce, I have found it most convenient to touch them with fuming nitric acid, and repeat the application upon the fall of the eschar as often as may be necessary; or, when prominent and pedunculated, they may be snipped off with scissors, and their base thoroughly cauterized, although, when cutting instruments are used, the hemorrhage is sometimes a little troublesome. As soon as the tenderness produced by the application of caustic has subsided, it is desirable to keep the glans uncovered in order to harden the internal layer of the prepuce by exposure to the air and friction; and, unless the preputial orifice is very narrow, this may generally be accomplished by wearing for a few days a narrow bandage round the penis posterior to the glans. Special attention should also be paid to removing any collection of the *smegma præputii*, and keeping the parts perfectly clean.

The nitric acid acts so favorably, that I have seldom resorted to other caustics, with the exception of chromic acid, which has come into favor within a few years.[1] A solution of this acid (one hundred grains to the ounce of water) is a powerful escharotic, and is especially useful in those obstinate cases in which the vegetation repeatedly returns after removal; but it should be applied with caution, simply moistening the surface of the morbid growth and sparing the healthy tissues in the neighborhood, or otherwise it is apt to induce severe pain and inflammation.

I have sometimes employed a mixture of equal parts of dilute muriatic acid and tincture of the chloride of iron, which is one of the best escharotics for warts upon the hands in children.

Vegetations about the vulva may be treated in the same way as

[1] See Dublin Quarterly Journal of Med. Science, vol. xiii., p. 250; Ranking's Abstract, vol. xxv., p. 149; New Orleans Med. News, Nov., 1857.

those upon the prepuce. When situated around the margin of the anus, they are generally of considerable size, and require to be snipped off with scissors before the application of acid to the base.

As these pages are passing through the press, my attention has been called by a very reliable surgical friend to the efficacy of simply powdering the growth with dry calomel in the treatment of vegetations. Under this application, the warts are said to rapidly shrivel up and disappear.

Vegetations during pregnancy may appear at quite an early period; they grow very rapidly, and often attain an immense size. I have seen a mass as large as a man's arm, extending from the mons veneris to the sacrum, and surrounding the vulva and anus. During gestation no operative procedure is admissible; but the pain, itching, and offensive odor may be palliated by careful attention to cleanliness and lotions of diluted Labarraque's solution, or the application of some astringent powder, as equal parts of savin and burnt alum. After delivery, they often disappear spontaneously, or may be removed by the knife or caustic; but when the mass is very large, only a portion should be attacked at a time.[1]

Vegetations situated upon a chancre or mucous patch cannot always be distinguished from those upon the sound integument; but the history of the case, and, especially, the coexisting symptoms, will determine whether mercury is required to combat syphilitic infection of the general system.

[1] A résumé of the articles which have appeared upon vegetations in pregnant women may be found in the Gaz. Hedomadaire for Feb. 8, 1861.

CHAPTER XIII.

STRICTURE OF THE URETHRA.

HAVING considered the complications of gonorrhœa, it remains to speak of one of the most frequent and important results of the same disease, urethral stricture.

ANATOMICAL CONSIDERATIONS.

An acquaintance with the anatomy of the urethra—including the character of its lining membrane, the fibrous, muscular, elastic, and erectile tissues which surround it, its dimensions and direction—is essential to a proper appreciation of the pathology of stricture and the skilful execution of operative procedures requisite in its treatment.

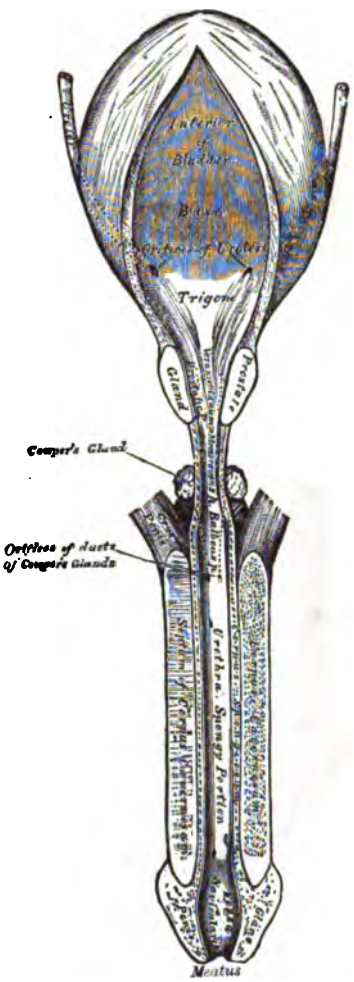
The male urethra is naturally divided into three portions, viz., the prostatic, membranous, and spongy.

The *prostatic urethra* is the portion included in the prostate gland, and generally, but not always, traverses this body at the union of its middle and upper thirds. Its length in the adult is about one inch and a quarter; its posterior boundary is a prominence of the mucous membrane, called the uvula vesicæ; its cavity is fusiform, largest in the centre, and somewhat contracted towards either extremity. Upon its floor, a short distance in front of the uvula, is an abrupt elevation of the mucous membrane and subjacent tissue, which forms a ridge three-fourths of an inch in length, and which gradually subsides as it approaches the membranous urethra. This prominence is known as the *veru montanum, crista urethræ,* or *caput gallinaginis.* It contains erectile tissue, connected with that of the corpus spongiosum, and is adapted to assist in the closure of the urethra at this point, and prevent the passage backwards of the semen during coitus. Directly in front of the summit of the veru montanum, is a small sac or pouch, three or four lines in depth, which is called the "sinus pocularis," and also, from its probable homology to the

womb, the "uterus masculinus."[1] The ejaculatory ducts traverse the walls of this cavity and open upon its margin. On each side of the veru is a depression called the "prostatic sinus," in which are found the orifices of the prostatic ducts, from twenty to thirty in number.

The *membranous urethra* extends from the apex of the prostate to the bulb, and is nearly or wholly included within the two layers of the deep perineal fascia. It is about three-fourths of an inch in length on its upper, but is shorter on its lower surface, owing to the encroachment of the bulb upon the latter. It is narrower than any other part of the urethra, except the meatus, and in consequence of the greater development and number of muscular tissues surrounding it, possesses in a higher degree the power of contraction. This characteristic has led some authors to give it the name of the "muscular region" of the urethra.

Fig. 5.



The bladder and urethra laid open. Seen from above. (After GRAY.)

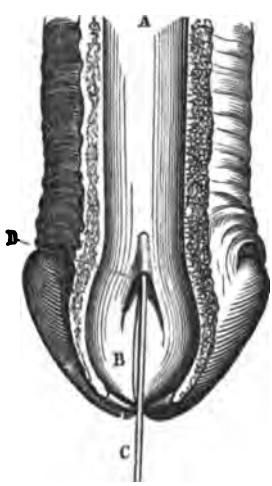
The *spongy urethra*, inclosed in the erectile tissue of the corpus spongiosum, varies in length according to the degree of turgescence of the penis; in a state of relaxation, it usually measures about five inches; during erection, it may attain seven or eight. The posterior portion of this region is somewhat dilated, especially on its inferior aspect, and has received the name of "the sinus of the bulb." The term "bulbous portion" is also applied to the posterior inch of the spongy urethra. The ducts of Cowper's glands open near its centre. Besides being somewhat dilated, the sinus of the bulb is extremely dilatable. This may

[1] The most recent philosophical anatomists confirm the analogy between the prostatic vesicle and the uterus. For an able résumé of this subject, see SIMPSON, Obstetric Memoirs and Contributions, vol. ii., p. 294. Philadelphia, 1856.

be shown by two casts of the urethra in fusible metal, the one taken while the canal is simply filled, the other while it is forcibly distended by the metal. The difference in the size of the part corresponding to the bulb will exhibit the dilatability of which it is susceptible. Wood-cuts of two casts thus taken may be found in the *London Lancet* (Am. ed.), Aug. 1851, p. 97. Anterior to its sinus, the spongy portion maintains a nearly uniform diameter until within about an inch of the meatus, where it again enlarges and forms the "fossa navicularis." Lastly, the external orifice or "meatus" is a narrow vertical slit, which is the most contracted part of the whole canal. In some rare instances, however, the smallest diameter is found about a quarter of an inch within the meatus, where it can of course be seen.

The mucous membrane lining these various regions is continuous posteriorly with that of the bladder, and anteriorly with the covering of the glans penis. It is very delicate in its structure, and abundantly supplied with bloodvessels and nerves, which render it highly vascular and sensitive. Numerous glands ("glands of Littre"), racemose in their structure,[1] are found in the spongy and membranous, and mucous follicles in the prostatic region, the secretion from all of which constantly lubricates the passage. Fossæ or lacunæ of the mucous membrane, apparently destitute of glandular structure, are also found upon the upper, and more numerously upon the lower surface of the urethra. They may sometimes be traced for nearly half an inch beneath the lining membrane, and their mouths are commonly directed forwards. One, larger than the rest, and called the "lacuna magna," is situated on the upper aspect of the canal, from half an inch to an inch posterior to the meatus. These lacunæ, especially when dilated by long-continued inflammation, may obstruct the passage of a sound and lead to the formation of false passages. The urethral mucous membrane is covered with the cylindrical form of epithelium. Except in the prostatic region, this membrane is arranged in longitudinal folds, which are

Fig. 6.



A. Superior surface of urethra. *B.* Fossa navicularis. *C.* Probe inserted in *D*, the lacuna magna. (After PHILLIPS.)

[1] KÖLLIKER, Manual of Human Histology, published by the Sydenham Soc., vol. ii., p. 236.

generally in contact, and close the canal, the latter appearing on a transverse section of the penis as a mere star or slit. The fact that the urethra, under ordinary circumstances, is collapsed, and cannot be said to constitute a tube except when distended, is of importance with reference to the method of using injections in gonorrhœa. Unless the meatus be compressed, it is hardly possible that the urethral folds should be thoroughly opened, so that the fluid may come in contact with the whole mucous surface and the mouths of its lacunæ; and unless this be accomplished, injections can be of but little avail.

According to Mr. Thompson, the rugæ of the mucous membrane "appear to be connected with the existence of numerous long and slender bands of fibrous tissue, which are seen lying immediately beneath the mucous membrane, for the most part in a longitudinal direction. In the bulbous and membranous portions they are extremely delicate, constituting these the weakest parts of the urethral wall, a fact worthy of remembrance in connection with the use of instruments."[1] In the bulbous region the danger of doing violence is increased by the dilatability of the passage, and by the presence of the firm anterior layer of perineal fascia just beyond it.

The dimensions and direction of the urethra, taken as a whole, will be better appreciated after considering other tissues which surround it.

The urethra is invested by "unstriped, organic, or involuntary" *muscular fibres*, one layer of which is separated from the mucous membrane throughout its whole course, merely by elastic and areolar tissue; while in the prostatic and spongy regions, a second layer is found external to the prostate and corpus spongiosum; the two being united in the membranous region. These fibres were first noticed by Kölliker,[2] in 1848, and afterwards more fully described by Mr. Hancock. The first series of fibres above mentioned is continuous posteriorly with the inner muscular layer of the bladder while "the outer layer of the muscular coat of the bladder passes forwards on the outside of the prostate gland, to assist in forming the organic muscular covering of the membranous portion of the urethra; whilst superiorly, or on the upper surface of the gland, these external longitudinal fibres are arranged in two or more bun-

[1] Pathology and Treatment of Stricture of the Urethra, 2d ed., London, 1858, p. 12. I am greatly indebted to this unrivalled monograph for much that is contained in the present chapter upon stricture.

[2] Beitrage zür Kenntniss der glatten Muskeln, Zeitschrift für Wissen, Leipzic, 1848, Band i, p. 67.

dles, which are attached to the pubes near its symphysis. From the front of the prostate the conjoined layer of muscular fibres passes forwards to the bulb, investing the membranous portion of the urethra, covered by, but distinct from the common muscles of the part, the latter being inorganic, voluntary, or striated; these being organic and nucleated. Arrived, however, at the bulb, these two layers again part company, and extend forwards through the whole length of the spongy portion of the urethra, the internal layer running between the corpus spongiosum itself and the urethra, but separated from the latter by areolar tissue; the external lying on the outside of the corpus spongiosum, separating the proper spongy tissue from its fibrous investment. Upon reaching the anterior extremity of the urethra, these two layers again unite, and form a circular body or band of organic muscular fibres, constituting that peculiar structure usually denominated 'the lips of the urethra,' and which had previously been considered by Mr. Guthrie as surrounded by a peculiar dense structure, analogous to that which forms the edge of the eyelid, and which, he believed, was requisite to maintain the patency of the opening; so that not only have we the urethra supplied by a coat of organic or involuntary muscular fibre, but the spongy body itself lies between its two layers of involuntary muscle; an arrangement, doubtless, of very great importance, in relation to the due performance of the functions of the part."[1]

The demonstration of this continuous layer of muscular tissue surrounding the whole course of the urethra, is of the highest importance, both with reference to the treatment of stricture and the influence which muscular spasm may have in its production.

Involuntary muscular fibre also enters largely into the composition of the prostate gland, of which it is said to constitute no less than two-thirds, and of the laminæ or "trabeculæ" of the corpus spongiosum; and although its primary function may be to evacuate the secretion of the glandular structure of the prostate on the one hand, and, on the other, blood which has served the purposes of erection, yet it can scarcely be doubted that it may also act as a sphincter and compress the urethra in the prostatic and spongy regions.[2]

The *corpus spongiosum* is dilated at its posterior extremity where it forms the bulb; and since the urethra, leaving the membranous region, enters this portion nearer its upper than its lower surface, the larger part of the erectile tissue at this point is found below

[1] HANCOCK, Strictures of the Urethra, London, 1852, p. 15.

[2] THOMPSON, op. cit., p. 44.

the canal. The corpus spongiosum terminates anteriorly in an expansion, called the "glans penis;" while a thin layer of erectile tissue is continued backwards around the membranous portion of the urethra and extends into the veru montanum of the prostate.

Fig. 7.

The accompanying diagram, drawn by Mr. Thompson from a dissection upon the dead body, exhibits the depth and position of the bulb, and its relation to the rectum; a matter of no small importance with reference to operations upon this part.

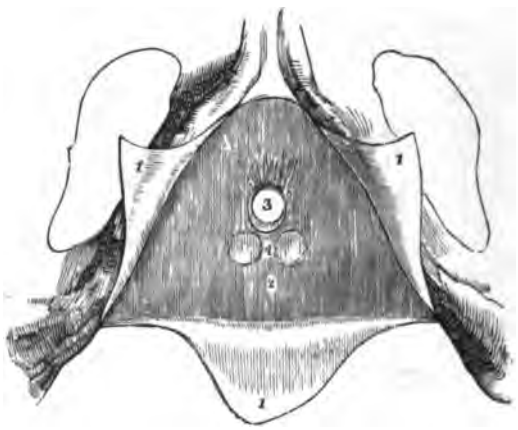
The corpus spongiosum consists of a vast number of venous sinuses, communicating with each other in all directions. Its great vascularity explains the hemorrhage which is liable to ensue, when the spongy, and also the membranous, portion of the urethra is divided by the knife of the surgeon or accidentally wounded. This occurrence, however, is less likely to take place, when an incision is confined to the mesial line; either in consequence of the fibrous partition which separates the two lateral portions of the vascular tissue at this point, or, as suggested by Mr. Thompson, because the two branches of the pudic artery, which lie one on either side, are thus avoided.

The *corpora cavernosa* are two in number. Arising in front of the tuber ischii, and intimately united to the periosteum covering the rami of the ischium and pubis, the two unite in front of the symphysis, to which they are connected by the suspensory ligament,

and are continued forwards as far as the corona glandis, where their common extremity is capped by the expansion of the corpus spongiosum forming the glans. The vascular connection between these bodies is free, though little, if any, exists between them and the corpus spongiosum, which lies in a groove upon their under surface.

Deep Perineal Fascia.—The triangular space, seen in the bony pelvis to intervene between the pubic and ischiatic rami, is occupied

Fig. 8.



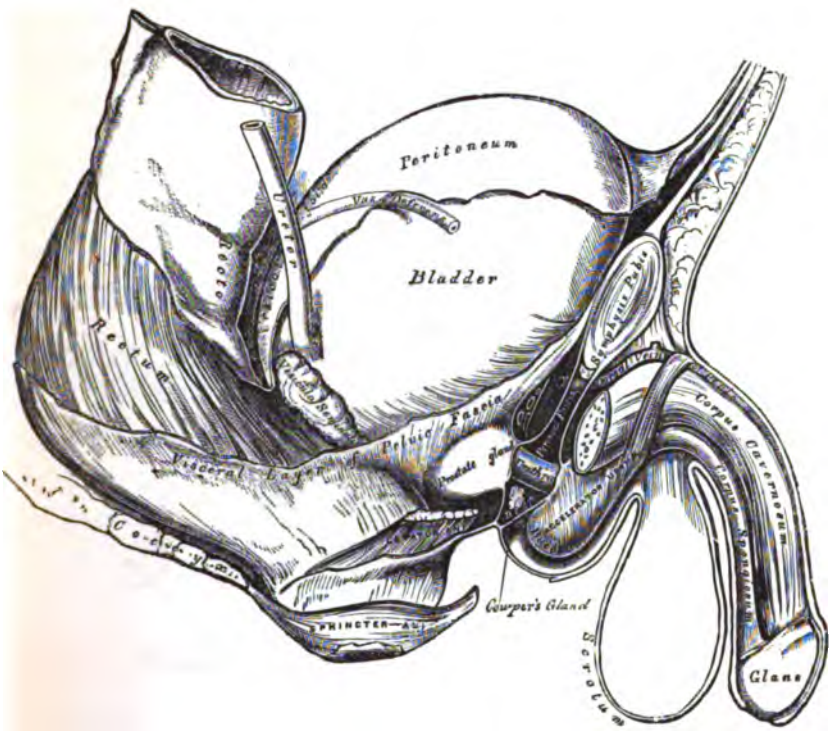
1, 1, 1. Flaps of the divided superficial fascia. 2. Anterior layer of deep perineal fascia. 3. Urethral opening. 4. Position of Cowper's glands behind anterior layer of deep fascia.

by a tense, fibrous septum, constituting one of the chief supports of the pelvic viscera above, and known by the various names of "deep perineal fascia," "triangular ligament of the urethra," "Camper's ligament," "middle perineal fascia," "ano-pubic aponeurosis," etc. This septum is composed of two layers, separated by an interval in which are found the membranous portion of the urethra, which necessarily passes through the deep perineal fascia to arrive at the surface, the compressor urethræ muscle, Cowper's glands and ducts, the arteries of the bulb, and the dorsal vein, nerve, and artery of the penis. We might familiarly liken this septum to a double window, through which a funnel, representing the urethra, passes; in which case the portion of the funnel contained between the sashes would correspond to the membranous region.

At their apex, the two layers of the deep perineal fascia are thin and firmly attached to the sub-pubic ligament and pubic bones; they then pass downwards and backwards, and are stretched between

the pubic and ischiatic rami. The space between them, containing the important parts already mentioned, is from half to three-fourths of an inch in depth. The vena dorsalis penis pierces the fascia

Fig. 9.

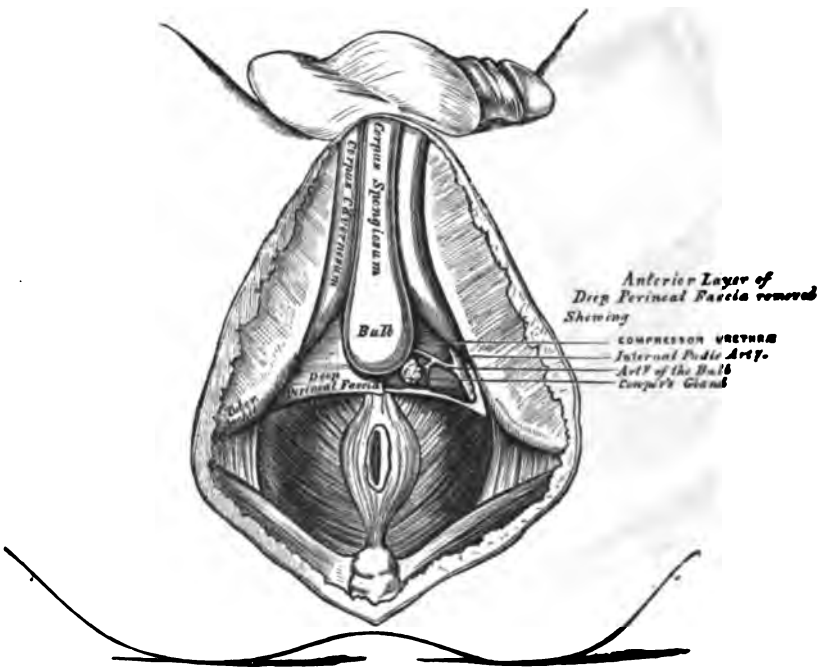


(After GRAY.)

half an inch, and the urethra usually at about an inch below the symphysis; but, according to measurements made by Mr. Thompson, the latter distance may vary from seven-eighths to an inch and a quarter; a difference of some importance as affecting the sub-pubic curve of the urethra. From the urethral opening two processes are sent off, one anteriorly to inclose the bulb, and the other posteriorly to become continuous with the fibrous capsule which surrounds the prostate gland. The inferior margin, or base, of the deep perineal fascia is directed towards the rectum, and sends off a thin fascia which covers the inferior surface of the levator ani muscle; its anterior layer winds round the transversus perinei, and, thus doubled on itself, becomes continuous with the superficial perineal fascia.

Superficial Perineal Fascia.—Strictly speaking, there are two layers of this fascia, the superficial and deep. The former consists of cellulo-adipose tissue, belonging to the general integument of

Fig. 10.



(After GRAY.)

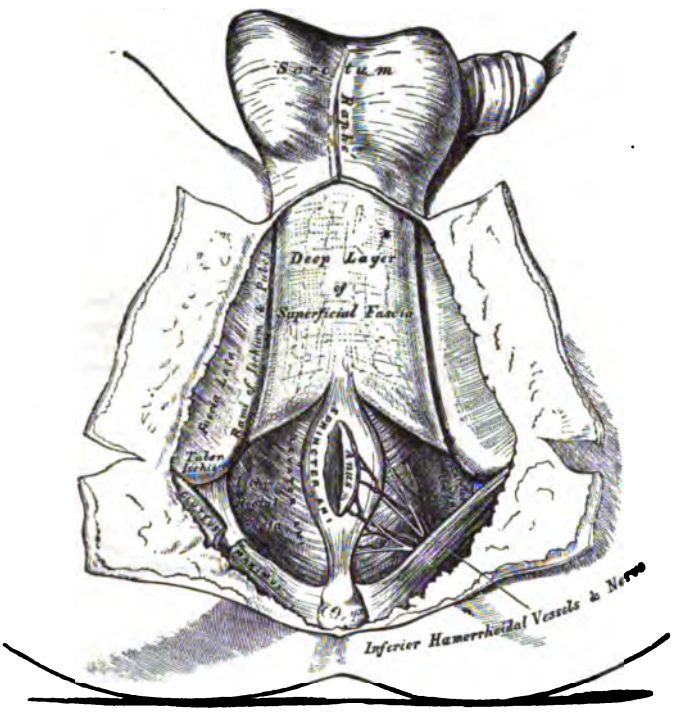
the body. The latter is aponeurotic in its structure, and is chiefly important in its relation to the present subject. In accordance with frequent usage, it alone is intended by the term "superficial fascia of the perineum." This fibrous structure corresponds in its general direction with the deep perineal fascia just described, but is situated upon a more external plane; behind the transversus perinei muscle it is continuous with the anterior layer of the latter fascia; at the sides, it is attached to the rami of the pubic and ischiatic bones; while in front it joins the dartos of the scrotum, the sheath of the penis, and the abdominal fascia. It also sends off processes which invest the transversus perinei and the muscles about the root of the penis.

The relations of the superficial fascia to the penis have been more fully described than elsewhere, in the first volume of the *Transactions of the American Medical Association*, by Dr. Gurdon Buck, of

New York. As this paper is not generally accessible, and deserves a much wider circulation than it has received, I shall quote the greater part of it.

"The anatomical structure in question consists of a distinct membranous sheath investing the penis in the manner to be described,

Fig. 11.



(After GRAY.)

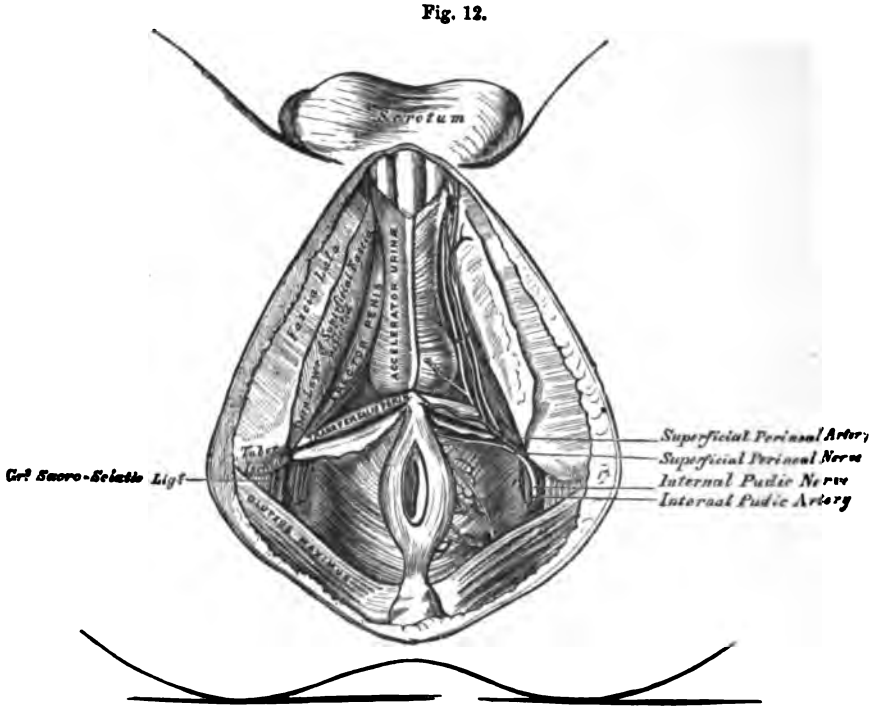
and forming a continuation of the suspensory ligament above, and of the perineal fascia below, and will be best understood by a description of the mode of dissecting it.

"The penis and scrotum are to be circumscribed by an incision at the distance of three fingers' breadth all around, and crossing the perineum at the anterior margin of the sphincter.

"The dissection of the skin and subjacent cellular and adipose tissues is to be made towards the penis, on the level of the fascia lata laterally, and of the perineal fascia posteriorly, and carefully continued to the body of the penis, as far as the corona glandis. By this means, the penis, as well as the suspensory ligament, is denuded of its loose movable investments.

"An incision is then to be made along the dorsum of the penis exactly in the median line, splitting through the suspensory liga

Fig. 12.



(After GRAY.)

ment, and extending forward to the corona, between the dorsal vessels and nerves that run parallel on either side. The adhesions of the sheath along the dorsum are firm, and require careful dissection; the bloodvessels and nerves being raised with it, serve as a guide to show the line of adhesion.

"The dissection being prosecuted laterally as well as inferiorly and at the extremity, the entire corpus cavernosum is enucleated, the muscles of the perineum being raised with the sheath. It is now clearly seen that the suspensory ligament from above, and the perineal fascia from below and laterally, form one continuous membrane with the sheath, inclosing the corpus cavernosum in its cavity, and embracing the corpus spongiosum urethræ between two layers, one of which passes above, and the other below it. The excavated base of the glans adheres inseparably to the outer surface of the sheath, while, by means of its inner surface, it caps the summit of the corpus cavernosum.

"Its adhesions are most firm at the extremity of the corpus cavernosum, along its dorsal surface, and at the insertions of the erector and accelerator muscles. It is thickest around the corona, along the dorsal surface, and where it forms the suspensory ligament. Zones of vessels run at regular intervals in the direction of the circumference of the penis, from the dorsal trunks to the corpus spongiosum, between the layers of the sheath. The cavity formed by the sheath, and occupied by the corpus cavernosum, is limited posteriorly by the triangular ligament (deep perineal fascia).[1]

"That portion which covers the perineal muscles, and has been described by authors under the names of the superficial fascia of the perineum, inferior fascia and ano-penic fascia, arises laterally from the ascending rami of the ischium, and descending of the pubis, as far forward as the inferior edge of the symphysis, where the two layers meet and form the suspensory ligament. Posteriorly, it is continued over the transverse muscle, and folding around its edges is prolonged upwards into the ischio-rectal fossa.

"It also sends off from its upper surface membranous septa between the accelerator muscles in the middle, and the erectors on either side, to join the triangular ligament, and thus forms three distinct and independent sheaths that are confounded anteriorly with the common sheath investing the corpus cavernosum."

M. Jarjavay has more recently confirmed Dr. Buck's observations, and gives full credit to the "Chirurgien de l'Amérique" for the originality of his discovery.[2]

Richet,[3] while agreeing with Dr. Buck in the main, differs from him in some particulars. He states that the posterior portion of this fascia is quite loose and areolar upon the dorsum, where it cannot be distinguished from that covering the pubes; and that thus a communication is opened by which infiltrations of urine may gain the sub-integumental cellular tissue of the penis and abdomen without perforating the fascia.

The spaces intervening between the fasciæ now described may be said to constitute natural reservoirs, to which infiltrations of urine and collections of matter, consequent upon rupture of the urethra or inflammation in its neighborhood, are chiefly confined; this being

[1] It would thus appear that the process of the anterior layer of the deep perineal fascia which is prolonged upon the bulb finally unites with the superficial fascia; and it is so stated by Velpeau, "Traité complet d'Anatomie Chirurgicale," Paris, 1837, tome second, p. 216.

[2] JARJAVAY, Traité d'Anatomie Chirurgicale, Paris, 1854, tome second, p. 576.

[3] RICHET, Traité d'Anatomie Medico-chirurgicale, 2d ed., Paris, 1860.

true at the outset of such effusions, and possibly so throughout their whole course; although in many instances the aponeurotic wall is eventually ruptured, or opened by a process of ulceration, when a more extensive diffusion of the contents takes place. The practical deductions from the direction and connection of these fascial planes are therefore of great importance. They may be briefly stated as follows:

Urine extravasated in the membranous or prostatic region, either advances towards the pelvic cavity through the fibrous sheath inclosing the prostate, or reaches the triangular space by the side of the rectum called the ischio-rectal fossa; in the latter situation, it is still, in most instances, deeply situated in the substance of the perineum; if it gain the surface it may extend around the union of the deep and superficial fascia, and be found in the cellulo-adipose tissue external to the last named fascia.

The superficial and the anterior layer of the deep perineal fascia, united behind the transversus perinei and attached on each side to the ischiatic and pubic rami, form a pouch with its outlet looking forwards and upwards, where purulent or urinary abscesses may form in consequence of rupture of the urethra anterior to the triangular ligament, and from which they can only extend into the scrotum or over the abdomen, the close attachment of the abdominal fascia to Poupart's ligament obstructing their passage down the thighs; occasionally, however, the matter breaks through this barrier, and has been known to descend nearly to the knee.

The presence of urine in the pouch just mentioned, is, however, for the most part secondary; when first extravasated anterior to the deep perineal fascia, it is confined within the aponeurotic structure described by Dr. Buck, where it may be felt as a firm, hard swelling situated beneath the superficial cellular tissue, which retains its natural suppleness and mobility. "Left to itself, the swelling sometimes gradually approaches the surface by appropriating to itself by adhesive inflammation the successive layers of cellular tissue covering it, and at length evacuating its contents externally through an ulcerated opening. This, however, is not uniformly the case. It often happens that the ulcerative process within the abscess goes on in advance of the adhesive and conservative process on the outside and opens a communication into the loose cellular tissue covering it, the consequence of which is rapid extravasation in every direction, filling up the scrotum, spreading up over the pubes, and sometimes extending along the crest of the ilium as high as the false ribs. It is probably rare that this extensive secondary form of extravasation

is not preceded by the circumscribed or primary form, hence the importance of the established rule of practice—to make a free opening into these hard swellings along the urethra as soon as their existence is ascertained. Another, and much more rare consequence of an opening of the urethra into the sheath, is the gradual formation of one or more fistulous tracks along the penis, terminating behind the corona glandis, and causing a good deal of thickening and induration of the tissues along their course."[1]

Voluntary Muscles.—It would be inconsistent with the limits of the present chapter to describe at length the various muscles which, correctly or incorrectly, have been supposed to act upon the urethra. Their anatomy is easily understood, and may be found in any anatomical text-book. Their physiological action is admirably described in Mr. Thompson's excellent monograph. The chief points of their relation to our present subject may be stated in a few words.

The *compressor urethræ*—including under this name the transverse muscular layer described by Mr. Guthrie, the descending fibres of Mr. Wilson, and the circular fibres of Müller—is a sphincter of the urethra surrounding the membranous region, and performing the same office for the bladder that the sphincter ani does for the rectum. Contraction of this muscle may contribute to the production of spasmodic stricture; it often opposes the passage of an instrument, or renders its introduction painful, even when there is no obstruction in the canal; it limits, to a great extent, the penetration of urethral injections from without, and prevents the exit of fluids injected by means of a catheter into the prostatic urethra.[2]

The anterior fibres of the *levator ani*, described by some authors as an independent muscle, under the name of "levator or compressor urethræ," encircle the prostate and neck of the bladder like a sling. and may assist in closing as well as elevating this portion of the urinary canal.[3]

The *bulbo-cavernosus*, by means of fibres which surround the corpus spongiosum and the corpora cavernosa, may exercise a similar office for the posterior portion of the spongy urethra.

The muscles now mentioned are voluntary, and act under the direction of the will; but the great abundance of organic muscular fibre, distributed around the urethra in situations already described, and the phenomena attendant upon the passage of urine and semen, leave no doubt that contraction of the urethra may take place as a purely reflex action.

[1] Buck, op. cit., p. 370. [2] See page 112. [3] Thompson, op. cit., p. 28.

Dimensions, Mobility, and Direction of the Urethra.—Having considered the separate portions of the urethra and the various tissues which surround it, we may now regard it as a unit; and more especially with reference to the size and form of instruments required in the treatment of stricture.

The statements of authors relative to the length of the male urethra range from five and a half to twelve inches. This discrepancy may be accounted for by the different methods employed in taking measurements; whether upon the living or dead subject; by the amount of traction exercised upon the parts; and also, to a certain extent, by an actual variation in different persons. The size of the penis appears to have no influence upon the length of the urethra; the latter, as shown by Sappey's observations,[1] often being in an inverse ratio to the former. The greatest source of variation is found in the length of the anterior or ascending portion of the subpubic curvature. Without seeking for any absolute standard, it is desirable to obtain an average which may assist in determining the situation of strictures, and afford useful information in their treatment; and after all that has been said by authors of the variable length of the urethra in different individuals, the results of measurements are found to be nearly identical, provided the method of making them be always the same.

The length of the urethra may be estimated during life by means of a graduated catheter, the flow of urine indicating when the eye near its point has reached the vesical extremity of the canal, and care being taken that the penis is not stretched upon the instrument. After death, the urethra and bladder may be removed from the body, slit open superiorly, gently extended upon some smooth surface, allowed to contract by their own elasticity, and then measured with a tape. Attempts have also been made to ascertain the length of the urethra by casts of the canal in fusible metal; but the two methods just mentioned are far more reliable.

According to the careful and minute observations of Mr. Thompson and Mr. Briggs, the results of measurements thus taken during life and after death are not identical; by the former, the average length is found to be seven and one-half-inches;[2] by the latter, eight and one-half. This difference is constant, and may readily be accounted for by the different conditions under which the measure-

[1] Recherches sur la Conformation Extérieure et la Structure de l'Urètre de l'Homme, Paris, 1854.

[2] Leroy d'Etiolles obtained an average of eight inches from one hundred measurements during life by means of a graduated gum-elastic sound. (*Des Rétrécissements de l'Urètre, &c.*, Paris, p. 5.)

ments are taken. It is worthy of remembrance, "since all accurate researches into the pathological anatomy of stricture are, of necessity, confined to an observation of the parts *after death*, while, in relation to treatment, the measurement *during life* is that which alone must be remembered."[1]

The urethra cannot be said to have any fixed and absolute diameter, since its walls admit of greater or less expansion according to the amount of force exerted upon them. A No. 12 catheter or sound of the ordinary scale rarely fails to pass with ease, if the parts be healthy; and not unfrequently No. 15 will pass without difficulty.

It is more important to be familiar with the relative than with the actual diameters of the different portions of the canal. The external orifice or meatus is almost invariably the most contracted part; so that whatever instrument fairly enters the urethra will pass through it, if no obstruction exists. Another important inference from this fact is, that to restore to its original calibre by dilatation one of the deeper portions of the urethra contracted by stricture, the meatus must be enlarged, which can generally be effected only by incision. The next narrowest point of the canal is at the junction of the bulbous and membranous regions; while the middle of the prostatic portion, and the sinus of the bulb are the widest.

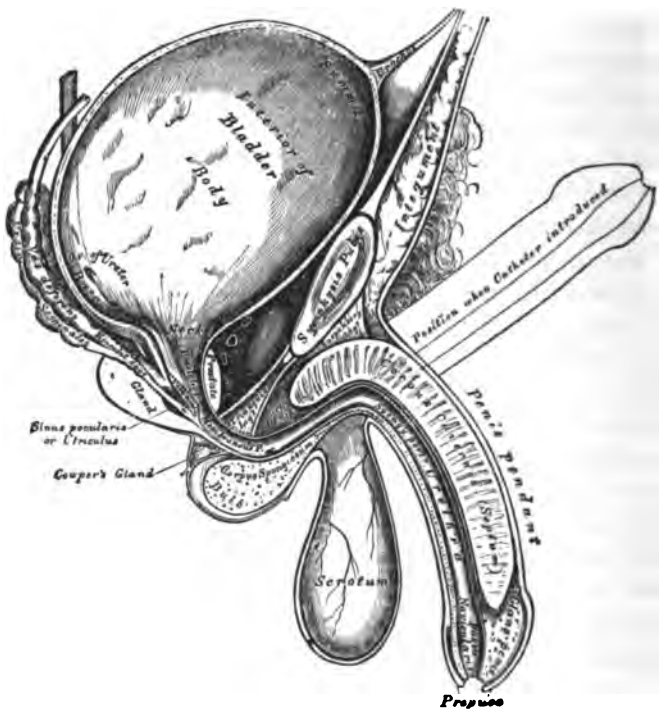
The degree of *mobility* of different portions of the urethra is chiefly influenced by the attachments of the neighboring fasciæ. The anterior part of the penis is free, and capable, in a flaccid condition, of assuming almost any position; in its posterior third, however, this organ is connected with the symphysis, by the suspensory ligament; with the ischiatic and pubic rami, by the crura of the corpora cavernosa, and with the anterior layer of the deep perineal fascia, by means of the bulb; the spongy urethra may, therefore, be said to be fixed in proportion as it approaches the membranous region. The membranous region is the least movable of all, owing to its firm connection with the pelvis by means of the two layers of deep perineal fascia. The prostatic urethra is susceptible of some slight change of position, dependent upon the action of the anterior fibres of the levator ani, and the amount of urine in the bladder.

In a flaccid condition of the penis, the urethra has two curves: the first confined to the anterior, the second to the deeper portion

[1] THOMPSON, op. cit., p. 4.

of the canal. The former is simply due to the dependent position of the anterior part of the organ, and is effaced in a state of erection or when the penis is elevated to an angle of about 60° with the body. The latter may be called the sub-pubic curve from its position beneath the symphysis. Unless some degree of force be used to straighten the canal, this curve is permanent, and a knowledge of its direction is essential in determining the proper form of instruments and the manner of their introduction.

Fig. 13.



Vertical section of bladder, penis, and urethra. (After GRAY.)

The sub-pubic curve commences an inch and a half anterior to the bulb, attains its lowest point, when the body is in the upright position, nearly opposite the anterior layer of the deep perineal fascia, and finally ascends through the membranous and prostatic regions. According to the observations of Mr. Thompson and Mr. Briggs, it "forms an arc of a circle three inches and a quarter in diameter; the cord of the arc being two inches and three-quarters, or rather less than one-third of the circumference." Mr. Thompson states that he has often found it more acute in spare men; and in

the corpulent, more obtuse; that traction of the abdominal muscles exercised through the suspensory ligament may also render it more abrupt, whence the advantage of raising the shoulders when performing catheterization upon patients in the recumbent posture. The elevation of the bladder above the pubes in children, and the enlargement of the prostate so common in old men, also effect a change in the direction of the sub-pubic curve from its usual adult standard, and require therefore a corresponding variation in the form of instruments. Swellings and abscesses about the lower extremity of the rectum, large hæmorrhoidal tumors, and various other circumstances may also operate in a greater or less degree to cause some change in the direction of this curve.

STRICTURES.

Strictures are most appropriately classified as TRANSITORY and PERMANENT. A transitory stricture, as the name implies, signifies a contraction of the urethra, capable of undergoing complete resolution through the action of natural forces. A permanent stricture is one dependent upon an organized, and consequently durable change in the tissues composing the urethral walls.

TRANSITORY STRICTURE.—The elements of a transitory stricture are *muscular spasm*, and *congestion* or *inflammation*. Either may exist alone; usually, both are combined.

The observation of certain phenomena attendant upon strictures, and upon the introduction of instruments into the urethra, had, for many years, led surgeons to believe that spasmodic action was, in some instances, the sole cause of urethral contractions; and that, in very many, it bore an important part in their production. At that time, however, the knowledge of muscular tissue surrounding the urethra was chiefly confined to the compressor urethræ; consequently many authorities denied the influence of spasm, except perhaps in the membranous region, to which this muscle is limited. The subsequent discovery by Kölliker and Hancock of organic muscular fibres around the whole canal has shown the possibility, and, reasoning from analogy, the probability, that spasmodic contraction may take place in any part of the urethra; and repeated observation of facts of frequent occurrence leaves no farther doubt upon the subject.

The phenomena of spasm are well known, and are the same in the urethra as in other parts of the body. Certain conditions of the

general system predispose to it; as, for instance, irritability of the nervous system, a gouty diathesis, congestion of the internal parts of the body from external influences; as cold, moisture, etc. The exciting cause is generally some impression upon the sentient nerves, transmitted to a nervous centre, and returned through motor fibres, terminating in either voluntary or involuntary muscles. In the urethra, spasmodic action, sufficient to produce stricture, may take place in the sub-mucous layer of organic fibres common to the whole canal; or, in the membranous region, in the striped fibres of the compressor urethræ; and, *perhaps*, to a less extent, in those of the acceleratores in the spongy region.

While performing catheterization upon irritable subjects, it has occasionally been observed by nearly every surgeon, that the instrument is grasped and temporarily held by the urethral walls, even when the canal is free from permanent obstruction. In this case, the sound, or catheter, acts as a foreign body, and the irritation which it produces is followed by contraction in accordance with the familiar laws of reflex action.

In other cases, the eccentric irritation is caused by laceration, abrasion, or a wound of the lining membrane, such as may ensue from the rough use of a catheter, or other surgical instrument. This, of itself, may excite spasm; or the same may be induced by contact of urine with the raw surface. The presence of some degree of congestion or inflammation, provided it be not sufficient to obstruct the canal, does not render the term "spasmodic stricture" inappropriate.

Striking examples of spasmodic stricture are also met with as the result of irritation about the rectum, excited by the presence of a tapeworm, ascarides, hæmorrhoids, fissure of the anus, fecal accumulation; or by operations upon this part, especially the ligature of piles. Sir Benjamin Brodie[1] met with a case of spasmodic stricture, in which the spasm was intermittent, recurring every twenty-four or forty-eight hours, and which was finally cured by quinine after the failure of other means.

Among other causes of spasm, are the presence of a stone in the bladder, or urethra; immoderate sexual intercourse; the free use of alcoholic stimulants; long retention of the urine; horseback exercise; digestive derangements; exposure to sudden changes of temperature, and mental emotion.

A spasmodic stricture is characterized by its short duration. It

[1] London Medical Gazette, vol. i., p. 507.

appears suddenly in persons of delicate habit, especially in those who have committed some imprudence in diet, and as suddenly disappears. Exploration of the canal by means of a sound after the spasm has passed, and frequently during its continuance, shows that there is no organic obstruction. Mr. Smith[1] details a case in which a patient, who had suffered from a violent attack of retention a short time before, suddenly died; and, at the post-mortem examination, not the slightest contraction was found.

Swelling is so constant an effect of inflammation as to be reckoned among its characteristic symptoms. In every acute attack of urethritis, the calibre of the urethra must be more or less diminished; and that this is a fact, is evinced by the diminution of volume in the stream of urine. The swelling of the mucous membrane is due in part to distention of its capillaries, and in part to infiltration of serum, or, sometimes, of more plastic material. Inflammatory products may become organized, and thus lay the foundation of permanent stricture; though, in most cases of acute gonorrhœa, they are soon absorbed, and the calibre of the urethra restored. Inflammatory or congestive stricture usually occurs in persons of a robust habit, in whom urethritis is decidedly acute, and is attended by very severe pain in the perineum and course of the urethra, and scalding in passing water; the penis is more or less turgescent, the lips of the meatus decidedly vascular, and the patient feverish.

In the great majority of cases, however, which come under the observation of the surgeon, inflammation and spasm are combined or to these is added some degree of permanent contraction. A patient has an organic stricture, which has given him but little annoyance, and offered no serious obstacle to the complete evacuation of the bladder; suddenly, after freely indulging in spirits, or coitus, and retaining his urine for several hours, he finds himself utterly unable to pass water. The urethra, partially contracted by organized deposit in and around its walls, is entirely closed by the supervention of congestion and spasm, and complete retention is the result. Under appropriate treatment, the congestion and spasm may be subdued, though the organic stricture remains after their disappearance.

The treatment of spasm and inflammation will be considered in the following pages, especially in connection with retention of urine, in the causation of which they constitute such important elements.

[1] Henry Smith, Stricture of the Urethra, London, 1857, p. 28.

PERMANENT OR ORGANIC STRICTURE.—The albuminous fluid which infiltrates the tissues in acute urethritis, and which may contribute to the formation of congestive stricture, is, in most cases, eventually absorbed, and the canal recovers its normal calibre. But under other circumstances, and especially as a consequence of chronic inflammation, products of a more plastic nature are thrown out, which become organized, exhibit the same tendency to contract as adventitious deposits in other parts of the body, and give rise to permanent contractions of the canal.

The seat of this fibro-plastic deposit is commonly in the substance of the lining membrane, in the cellular tissue beneath it, and, in severe cases, in the more external tissues. Mr. Thompson's[1] observations show that, in its incipiency, an organic stricture may consist of a mere thickening of the mucous membrane, hardly discernible when the urethra is laid open, and only evident on close inspection of a longitudinal section; at a stage slightly more advanced, the lining membrane loses its transparency, becomes puckered, is firmly adherent to the deeper tissues, and transverse fibres are found beneath, which encircle the canal like a purse-string; finally, in the most severe form, the meshes of the submucous tissue are filled with organized lymph, the fibres of organic muscle can no longer be detected, and the adventitious deposit may involve the substance of the corpus spongiosum, or even extend to the corpora cavernosa; giving to the penis a hard, nodulated feel, evident during life on external examination.

This organized material is found under the microscope to be identical with inflammatory products effused in other parts of the body, the tendency of which to contract and harden is well known. Mr. Thompson compares it to the interstitial deposit in the liver producing cirrhosis, to the lymph poured out in pleurisy, and to the substance of cicatrices following burns. The nature of this tissue fully explains the admitted necessity of long-continued dilatation to restore the original calibre of the contracted part, and the constant tendency which strictures exhibit to return, when once apparently cured, a tendency which is so universal, that Cruveilhier[2] has pronounced stricture of the urethra *absolutely incurable*. It is evident, moreover, that the diminution in the calibre of the urethra is but one of the bad effects of stricture; the normal elasticity of the canal is lost, and the exercise of its function seriously interfered with.

In exceptional cases the urethra is obstructed by the deposition

[1] Op. cit., p. 55. [2] Anatomie Pathologique du Corps Humain.

of a false membrane within its walls without any external constriction, in a manner analogous to the effusion upon the trachea and bronchi in croup. Mr. Hancock[1] describes the appearance presented at several post-mortem examinations which he had the opportunity of making, as follows: "The membrane was straw-colored, and for the most part adhered so firmly to the mucous membrane, that it was only by careful dissection we could separate the one from the other; indeed, so identified were the two, that had we remained content with a mere cursory or superficial examination, we might have imagined the morbid appearances to have depended upon thickening and puckering of the mucous membrane itself, rather than upon what actually obtained. It was only by the microscope that we could determine what was really the condition of the parts. The existence of this false membrane was proved by some points of great interest; among others, that although this newly-deposited structure appeared to be invested by mucous membrane when examined by the naked eye, the investment, though smooth and shining, did not possess the actual organization of mucous membrane, but, when viewed through the microscope, presented more the character of condensed cellular tissue. It did not possess either villi or papillæ upon its free surface; it was not invested by epithelial scales; and, what was extremely interesting, as incontrovertibly proving the non-identity of this membrane with the proper mucous canal, we found that by carefully dissecting it away, we came down upon the layer of epithelial scales separating it, as it were, from the proper mucous membrane of the urethra." Occasionally, according to Mr. Hancock, the posterior portion of the membrane is detached, and may constitute a valve; which, while offering little if any obstruction to a sound, may completely cut off the passage of the urine. "Primary croup" of the urethral mucous membrane is admitted by Rokitansky,[2] who states that it chiefly occurs in children. Mr. Thompson, in his examination of pathological collections in various museums, has found but three specimens of stricture which could be attributed to false membranes, and in two of these he is of the opinion that the appearances were due to dilated lacunæ; it is probable, therefore, that the cases described by Mr. Hancock are extremely rare.

A deposition of an entirely different character from that just described—with which, however, it may be confounded—is not unfrequently met with covering the urethral walls at the site of a

[1] Strictures of the Urethra, etc., London, 1852, p. 76.

[2] Syd. Soc. ed., vol. ii., p. 235.

stricture. It consists of a copious secretion of pasty mucus, "which may or may not be attended with an exuberant formation of epithelium, and in which, accordingly, the epithelium is either rapidly thrown off from an almost bare and, as it seems, excoriated mucous membrane, or accumulates over the whole or over parts of the surface, and thus forms a complete laminated covering for it, or patches of various thickness here and there upon it."[1] This pasty exudation is always the result of chronic inflammation, while the croupy deposit before described is due to that of an acute form.

In former times, when pathological anatomy was rarely studied minutely upon the dead body, all strictures were supposed to be due to fungous growths within the canal, which encroached upon its diameter and presented an obstacle to the passage of urine and the introduction of instruments. Subsequent observation has shown that such excrescences are very rarely the cause of obstruction, although they are sometimes met with. They have been observed and described by Sœmmering, Laennec, Charles Bell, Leroy d'Etiolles, Amussat, Ricord, Mercier, Mr. Henry Thompson, and others. Dr. Gross[2] says that he has "several times seen fleshy growths in the urethra;" and, from my own experience, I can testify to the not unfrequent occurrence of vegetations in the fossa navicularis in persons bearing similar growths upon the preputial mucous membrane. In this situation, however, I have rarely found them to seriously affect the exercise of the urethral function.

These "fungi, carnosities, caruncles, or excrescences," as they have been variously termed, may consist of a development of the mucous papillæ, like external warts upon the prepuce; of ordinary granulations, springing from an ulcerated surface; of true polypi; and, rarely, of tubercular or cancerous growths. Mr. Thompson states that the first variety mentioned is most frequent in the spongy region; that polypoid growths are confined to the prostatic urethra; and that tubercle and cancer are never primary formations, but always consecutive to their development in other portions of the urinary organs.

Strictures dependent upon varicose enlargements were at one time admitted, but their existence is not borne out by post-mortem examinations. The hemorrhage which sometimes attends the introduction of instruments, and is occasionally excessive, generally proceeds from vascular granulations, an abraded surface, or a wound of the

[1] Rokitansky, op. cit., vol. iii., p. 51.

[2] Practical Treatise on the Diseases, etc., of the Bladder, Prostate Gland, and Urethra, 2d ed., p. 759.

spongy tissue which surrounds a large portion of the urethra. It is probable that, in most cases, there is increased fulness of the vessels in the neighborhood of a stricture during life, although it is not always apparent after death.

Dr. Jameson relates the case of an aged seaman who had long labored under severe stricture and habitual retention, and at whose post-mortem, the "whole of the membranous portion of the urethra was found *ossified*, and reduced to the size of a crowquill."[1] Notwithstanding the high authority on which this statement is made, it appears to me probable that the appearances observed were due to the deposition of calculous matter imbedded in the urethral walls, and not to true ossification.

Finally, stricture may depend upon specific induration surrounding a chancre, concealed within the urethra; of which Ricord states that he has met with many examples.

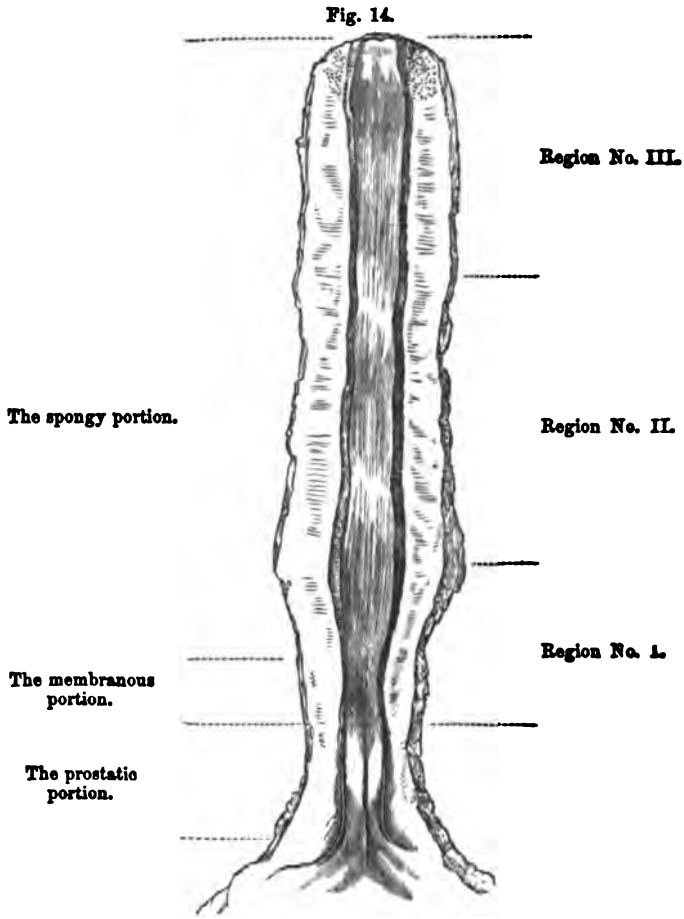
Seat.—There are several sources of error which should be avoided in attempts to determine the anatomical seat of strictures during life. These are the difference in the estimated length of the normal urethra, as given by different authors; the mobility of the stricture itself, which may often be thrust back to a considerable distance on the point of an instrument; the liability of the penis to be elongated by traction at the time of taking the measurement; and the actual elongation which often ensues as a consequence of the frequent handling which this organ receives from persons suffering under stricture. The great discrepancy in the statements of authors as to the most frequent seat of this complaint shows that these, and perhaps other sources of error have not been sufficiently guarded against; and the tendency has almost invariably been, as shown by recent investigations, to assign to stricture a seat posterior to its true situation.

I shall not waste time in quoting the different opinions which have been expressed upon this disputed point, but refer at once to the results obtained by Mr. Thompson from a careful and laborious examination of over three hundred preparations of stricture contained in the chief museums of Paris, London, and Edinburgh. It is only in this manner, by post-mortem inspection, that the locality of stricture can be ascertained with certainty and accuracy; and Mr. Thompson's conclusions will doubtless be regarded as decisive, until controverted by an examination of a still larger number of

[1] An Essay on Strictures of the Urethra, by H. G. Jameson, M. D., Surgeon to the Baltimore Hosp., Am. Med. Recorder, 1824, vol. vii., p. 251.

specimens, conducted with equal care and fidelity—an event not likely soon to happen.

Fig. 14.



"A healthy urethra, eight inches and a half in length, slit up from the upper part, accurately reduced on scale from a drawing made from the original while fresh, to half the natural size. On the left-hand side are indicated the anatomical divisions of the urethra, and on the right the boundaries of the regions referred to in relation to the locality of stricture." (THOMPSON.)

In relation to the locality of stricture, Mr. Thompson divides the urethra into the three following regions:—

I. THE SUB-PUBIC CURVATURE; which comprises an inch of the canal before, and three-quarters of an inch behind, the junction between the spongy and membranous regions, thus including the whole of the membranous portion.

II. THE CENTRE OF THE SPONGY PORTION, a region extending from the anterior limit of the preceding, to within two inches and a

half of the external meatus, and measuring therefore about two and a half to three inches in length.

III. THE EXTERNAL ORIFICE, INCLUDING A DISTANCE OF TWO INCHES AND A HALF BEHIND IT.

Of 270 preparations, embracing 320 distinct strictures, Mr. Thompson found

In region I	. . .	216	or 67 per cent.
" " II	. . .	51	" 16 " "
" " III	. . .	54	" 17 " "
		320	

It is thus seen that by far the largest number of strictures are situated at the sub-pubic curvature; and the most frequent locality may be still further limited to the anterior portion of this region, as appears from the following statement by Mr. Thompson: "That part of the urethra which is most frequently affected with stricture is the portion comprised in the inch anterior to the junction, that is, the posterior or bulbous part of the spongy portion. The liability of this part to stricture appears to diminish as it approaches the junction, where it is less common; while behind, it is very rare. Most rarely is a stricture found so far back as the posterior part of the membranous portion."[1] The next most frequent situation of stricture is the external two and a half inches, and the least frequent the middle portion of the spongy region, although the difference between the two is not very great; while both are of but small importance compared with the anterior portion of the bulb.

Mr. Walsh[2] has arrived at results identical with those of Mr. Thompson, from an examination of the preparations in the Royal College of Surgeons of Dublin; and in reviewing the observations of other surgeons, it is found, as a general rule, that, whenever their statements have been based upon post-mortem investigation, they do not differ materially from those here given.

M. Mercier,[3] who has probably paid more attention to the anatomy and pathology of the genito-urinary organs than any other French surgeon, states that strictures are almost exclusively limited to the spongy portion of the urethra, and are most frequent at the bulb. He believes that it is quite exceptional to meet with them as far back as the membranous portion.

[1] Op. cit., p. 83.

[2] Dublin Medical Press, Jan. 23, 1856, p. 51.

[3] Recherches sur le Traitement des Maladies des Voies Urinaires, 1856, p. 376. Also Bulletin de la Société Anatomique de Paris, 1858, p. 441.

It will be observed that no mention has been made of the prostatic portion of the urethra; a region which Sir Astley Cooper asserted was even second in the relative frequency of stricture. There can be no doubt that hypertrophy of the prostate was formerly mistaken, in many instances, for organic contraction of the canal; and recent observations show, that stricture of the prostatic urethra is so extremely rare that doubts of its existence are not unreasonable. Mr. Thompson states unhesitatingly that there is not a single case to be found in any of the public museums of London, Edinburgh or Paris. Mr. Walsh describes a preparation in the Museum of the Royal College of Surgeons in Dublin, in which a stricture commences in the posterior part of the membranous, and extends into the prostatic portion, causing a well-marked contraction. Mr. Crosse described and figured a case of prostatic stricture; Leroy D'Etiolles[1] and Ricord[2] say they have met with them; and Civiale[3] speaks of one.

In conclusion, it may be stated that modern investigation would appear to show that strictures are found only in those portions of the urethra which are surrounded by erectile tissue, and are most frequent where the latter is most abundant; hence, their most common seat is in the bulb, next in the remainder of the spongy portion, and finally in the membranous region, which is also invested with a thin layer of vascular tissue. In harmony with this law, the thickest portion of a stricture surrounding the bulbous urethra is below the canal, corresponding to the greater thickness of the erectile tissue in this direction.

Number.—In most cases there is only one stricture in the same subject. Of 267 preparations examined by Mr. Thompson, the stricture was single in 226. Occasionally there are several distinct contractions. Hunter[4] met with six; Colot with eight; and Ducamp with five; but Boyer never found more than three, and Mr. Thompson[5] never more than "three, or at the most, four." Civiale[6] says that when there are several, one of them is almost always situated in the sub-pubic curve, and the others between it and the meatus. It is to be understood in these remarks, that *distinct* strictures are alone referred to. The urethra is sometimes contracted for a considerable distance, several points of which are more constricted than others;

[1] Des Rétrécissements de l'Urètre, Paris, 1845, p. 83.
[2] Notes to Hunter on Venereal, 2d ed., Phil., 1859, p. 168.
[3] Maladies des Organes Genito-urinaires, 2d ed., Paris, 1850, vol. i., p. 158.
[4] Ricord and Hunter, op, cit., p. 168. [5] Op. cit., p. 54. [6] Op. cit., vol. i., p. 157.

but these are not to be regarded as separate strictures. Lengthy strictures are more frequently found in the spongy region than in the sub-pubic curve; and instances are recorded in which they have extended from the meatus nearly to the bulb.

Form.—The form of stricture necessarily varies with the amount and situation of the fibrinous deposit which produces it. This may consist of a few fibres, which encircle the whole or a part of the urethral circumference, like a thread, or may form a band, varying in extent and thickness. In the former case, the stricture, composed of a fold of mucous membrane inclosing the constricting fibres, has the appearance of a membranous diaphragm, which may embrace the whole or a part of the canal—in the one case like a narrow ring, and in the other like a crescent; it sometimes runs obliquely, instead of directly across the urethra; occasionally it is pierced by one or more holes. This is the "linear stricture" of Mr. Thompson and others; the "bridle stricture" of Charles Bell; and the "valvular stricture" of French writers. A rare variety of this form of stricture is a small narrow band stretched from side to side, or crossing the canal diagonally, and dividing the urethra into two portions. Mr. Thompson speaks of a preparation in the Museum of St. Bartholomew's Hospital, in which there are ten or eleven of these free bands, which this author is inclined to ascribe to short false passages. These bridles are sometimes of considerable size, as in another preparation of the same museum, in which the urethra is contracted throughout its whole length, and a rough, fibrous band, an inch in length, and attached only by its extremities, extends from the verumontanum forwards, to the membranous part of the urethra.

Where the fibrinous deposit is more extensive, the stricture covers a larger portion of the urethral walls. In some instances, it is abrupt on either side, like the last-mentioned form, but wider; as if a whip-cord were tied externally to the mucous membrane; this is called an "annular stricture." If the induration be more diffused around its base, a section of the canal will resemble an hour-glass, and the contraction receives the name of "indurated annular stricture." Mr. Thompson states that thickening of the tissues is generally greater on the lower than on the upper surface. Again, stricture may involve the canal to the extent of half an inch or several inches; when the passage is often more or less deviated from its normal direction, and the stricture is said to be "irregular or tortuous." It is chiefly in these cases that the induration is so excessive as to implicate the whole thickness of the corpus spongiosum, or

even a portion of the corpora cavernosa, and form hardened masses which are readily perceived by the finger during life.

Degree of Contraction.—The plastic material of stricture exhibits a constant tendency to contract, and become harder and firmer with

Fig. 15.

Fig. 16

Fig. 15. Annular stricture.

Fig. 16. Irregular, or tortuous stricture. Posterior to the stricture in each figure, are seen pouches of the mucous membrane, formed by dilatation of the lacunæ and ducts, and capable of entangling the point of an instrument. (After THOMPSON.)

time; it is consequently true, as a general rule, that the longer a stricture has existed, the more callous it is, and the less susceptible of dilatation. Exceptions to this law, however, sometimes exist; and strictures of long duration are met with which yield readily, while others, recent in their origin, prove very obstinate. Again, there is a class of strictures which are amenable to the process of dilatation, but which rapidly contract again, and in a very short time after the cessation of treatment, are as narrow as ever. They are most frequently found in the bulbous and spongy portions of the urethra, where the character of the surrounding tissues admits of a more extensive effusion of plastic material than in the deeper parts of the canal. They constitute the "resilient stricture" of Mr. Syme. When two strictures are present—one in the anterior, and the other in the posterior portion of the urethra—the latter will generally be found to dilate much more rapidly than the former.

Complete obliteration of the urethra may take place as a consequence of a wound of the canal, sometimes from within, but more

frequently from without. In stricture, other than those of traumatic origin, the urethral walls are probably never completely fused together; although cases are reported in which fistulous passages had for a long time turned the urine from its normal channel, and in which, on post-mortem examination, it was impossible to introduce the finest probe through the contraction, even after the external portion of the penis had been slit up.[1] Instances of this kind, however, are rare; in most cases, however great the narrowing, urine will still find its way out, though it may be only by a few drops at a time.

There has been no little discussion of the question, whether the urethra, when permeable to urine, is always permeable to instruments, a question of importance in its bearing upon perineal section as advocated by Mr. Syme, Professor of Clinical Surgery in the University of Edinburgh. Some misconception of Mr. Syme's views has at times been entertained, and it has been supposed that he asserted the immediate permeability of strictures under all circumstances. The true opinion of this surgeon will be best given in his own words. He says: "As to the question of 'impermeability,' I simply maintain, that if the urine passes out, instruments may always, through care and perseverance, be got in beyond the contraction. It should be observed that the case here is quite different from that of a distended bladder requiring *immediate* relief. I have never maintained that in such circumstances the introduction of a catheter was always practicable."[2]

Mr. Liston previously took similar ground, and asserted that he had never seen impassable stricture; "for, when any water comes away, you can, by patience and perseverance, get a catheter through, sooner or later."

Dr. Phillips holds the same views as Mr. Syme. In his *Traité des Voies Urinaires*,[3] he says: "Mr. Syme asserts that no stricture is impassable; whenever the urine can find exit, even in a few drops only, a fine bougie can be introduced. I am entirely of this opinion, however absolute it may appear.' Dr. Phillips has acquired considerable reputation in Paris by performing catheterism in cases where Nélaton and other surgeons had failed; but this success has been attained in some instances only after attempts repeated and prolonged to a greater extent than is usually considered justifiable. In

[1] THOMPSON, op. cit., p. 60–1.
[2] Edinburgh Monthly Journal, June, 1851.
[3] Page 194.

one case six sessions of three hours each were required, and when the reader is informed that Dr. Phillips always places the patient during catheterization in the standing posture, it will be seen that no small amount of endurance was required.

Mr. Syme's views have not been generally adopted by the profession at large. They have excited much opposition abroad; and, in this country, I think I can safely say that no surgeon of any considerable experience will maintain that he has never seen an "impassable stricture;" yet the records of surgery will show that the surgeons of America are not behind those of other countries in skill and manual dexterity. In the latter years of his life, Mr. Liston was repeatedly foiled in attempts to introduce a catheter, and Mr Cadge, who assisted this surgeon in his operations for some time before his death, says: "I have notes of four cases in which, after repeated unsuccessful attempts to introduce an instrument, Mr. Liston secured the patients as for lithotomy, and opened the urethra by an incision in the perineum." The great advocate of permeability, Mr. Syme himself, has also been foiled, as will appear from the following confession in the second edition of his work:[1] "In many cases, I have had to wait days, or even weeks, before the passage could be hit. Indeed, on three occasions—one in private and two in public—I found it necessary to open the urethra anteriorly to the stricture, so as to obtain the assistance of a finger placed in the canal, to guide the point of the instrument." As intimated by one of his reviewers, "this is most suspiciously like a 'buttonhole' contrivance, and unavoidably suggests the idea of a back door in the operator's argument."

It is not intended by these remarks to disparage the skill, gentleness, and perseverance which will often triumph over an obstinate stricture, when less able hands have failed. It is to be recollected, too, that the greater the surgeon's confidence in his instrument, the more likely he will be to succeed. It may be admitted, also, that where the necessary qualifications are present, instances of failure are rare; but to claim that such never occur, exceeds the bounds of truth, and is calculated to discourage the student in the use of the catheter. In the words of one of our most eminent surgeons, "I assert, upon the testimony of personal experience, the best test of all, that there is a class of strictures, the result of ordinary causes, which, while they admit of the passage of urine, slowly and imperfectly it

[1] Pp. 83–86.

may be, do not permit the introduction of any instrument, however small, into the bladder."[1]

After all, may it not be said with truth, that the difference of opinion upon this question is rather one of words than of facts?

PATHOLOGY OF STRICTURE.

In mild cases of stricture, the canal in front of the contraction preserves its normal dimensions and character; but in severe and chronic cases, when the flow of urine has been much obstructed, and the anterior portion of the urethra, either through sympathy or continuity of tissue, has participated in the inflammation which chiefly affects the part behind the stricture, it is contracted; another condition, difficult of explanation, is one of dilatation, which, in a case described and figured by Charles Bell, was very considerable. Instances in which the urethra was ulcerated in front of the stricture, are also given by the same author.

Posterior to the stricture, the urethra is generally enlarged, as a natural consequence of the impediment to the free evacuation of the bladder. The canal ultimately loses its elasticity and becomes dilated so as readily to admit the finger, or even form a pouch which may appear as a fluctuating tumor in the perineum. Sir Benjamin Brodie relates the case of a patient who had a stricture at the distance of three inches behind the external meatus; whenever he made water, a tumor presented itself in the perineum, as large as a small orange, which was punctured with a lancet, and gave exit to a full stream of urine, which was allowed to flow through the artificial opening until the stricture had been effectually treated by dilatation.[2] The lacunæ of the mucous membrane and the orifices of the prostatic and ejaculatory ducts frequently participate in this enlargement; and the septa between the pouches thus formed constitute a network, chiefly confined to the floor and sides of the canal, which is well adapted to obstruct the passage of an instrument unless the point be well elevated towards the pubis. This condition is represented in Figs. 15 and 16, taken from Mr. Thompson's work. In consequence of continued pressure, the prominence of the verumontanum may also be entirely effaced. The prostatic portion of the urethra is particularly susceptible of the dilatation now described, while the membranous is less so; indeed, when the stricture is situated in front of the triangular ligament, the latter portion *may* retain its normal calibre—a fact to be remembered in relation to

[1] Gross, Diseases of the Urinary Bladder, etc., 2d edition. Philadelphia, 1855. p. 763.

[2] Lectures on the Diseases of the Urinary Organs. Philadelphia, 1847, p. 12.

perineal section, otherwise in performing this operation in cases of impassable contractions, dilatation of the urethra may be sought for as a guide to the incisions, when it does not exist.[1] When there are several strictures, the urethra is commonly somewhat dilated between them.

The mucous membrane, especially behind the stricture, is the seat of chronic inflammation; it is sometimes contracted and puckered; and sometimes thin, and minutely injected with bloodvessels; the surface is generally covered with a layer of pasty exudation, and it is from this source and from the bladder that the gleety discharge, which is so constant an attendant upon stricture, is derived. Ulceration frequently takes place, which may be superficial, or which may extend to the deeper tissues, producing large and ragged excavations of the urethral walls, or, in rare instances, it may even occasion destruction of the contracted portion of the canal. A patient, under the care of Sir Benjamin Brodie,[2] suffered from very severe pain at the site of his stricture for several days, after which his condition was much improved and he passed water better than he had done for years; the whole train of circumstances indicating that the stricture had been destroyed by ulceration.

Abscess and Fistula.—A still more serious consequence of stricture is the development of abscess and fistula in the neighborhood of the urethra. In most cases their mode of origin resembles the formation of abscess and fistula around the rectum; the urethral mucous membrane is impaired or destroyed at one or more points by ulceration; during the straining of micturition, urine, perhaps in a very minute quantity, escapes into the cellular tissue; an abscess is formed which burrows in various directions, or which opens and establishes a fistulous communication between the external surface and the urethra. In other cases abscesses are developed without rupture of the urethral walls or infiltration of urine; and they may even occur, when the obstruction to the evacuation of the bladder is far from complete. They can only be ascribed to the irritation produced in the surrounding parts by the presence of the stricture, especially if this be heightened by a careless use of instruments. Numerous post-mortem examinations have shown that there may be no connection between an abscess dependent upon stricture and the urethral canal; in many cases, however, a communication is subsequently established by the ulcerative process. When a urethral opening exists, it is generally behind the contracted part, but sometimes in front of it. Instances of urinary abscesses anterior to

[1] Guthrie, London Lancet, Am. ed., Sept. 1851, p. 173. [2] Op. cit., p. 16.

strictures have been recorded by Civiale,[1] Caudmont,[2] and others, and occasional specimens are found in various public museums. The course taken by urinary fistulæ is often very erratic; they may open into the rectum, upon the perineum, upon the surface of the scrotum, the lower part of the abdomen, or upon the thighs or nates. Thompson[3] refers to two specimens, in one of which the fistula traversed the thyroid foramen, and in the other terminated at the umbilicus; and a preparation was presented at the Société de Chirurgie, of Paris (Sept. 21, 1859), in which a fistula, originating in the bladder, passed through the horizontal ramus of the pubis, and terminated by several openings in the thigh; it is probable, however, that the patient, in addition to his stricture, had disease of the pubic bone, to which the bladder had become adherent.

These abnormal passages rarely have more than one opening into the urethra, but very frequently a number upon the external surface; in one case, seen by Civiale, the latter amounted to no less than fifty-two.[4] Their internal surface becomes lined with adventitious tissue, which bears a very close resemblance to mucous membrane, but is destitute of glands and follicles; it is organized, well supplied with nerves, bloodvessels, and absorbents, and constantly secretes a muco-purulent fluid. Their walls are so firm that the passage can often be traced like a cord underlying the skin. When numerous, the cellular tissue between and around them may become condensed through chronic inflammation into a hard, brawny mass, and the natural suppleness, if not the shape of the part, be lost. If the urethra be impermeable, the urine flows entirely through these abnormal channels; if pervious, more or less may still trickle away with each evacuation of the bladder. Calculous matter is deposited in fine particles or in larger masses, resembling mortar, upon the walls, and more particularly near the orifices or in some blind pouch opening into the passage.

Deposition of similar matter often takes place in the dilated sinuses of the prostate already described. This gland, moreover, may become inflamed, and abscesses form in its substance, which may remain for a long time circumscribed, open into the urethra, or effect a communication with the rectum or cellular tissue of the pelvis; or the prostate may be reduced to a pultaceous mass surrounded apparently by a membranous pouch, in which its normal structure can no longer be distinguished. Stricture of the urethra was formerly considered a frequent cause of senile enlargement of

[1] Op. cit., p. 505. [2] Bulletin de la Soc. Anatomique de Paris, 2e série, t. iv., p. 109.
[3] Op. cit., p. 68. [4] Op. cit., vol. i., p. 530.

the prostate, but numerous examinations of the dead and living subject have shown that the two rarely coexist, and that there is probably no connection between them.[1]

Bladder.—That increased action shall be followed by increased development is a general law of the animal economy. For the same reason that the blacksmith's arm grows large and powerful, the vesical walls become hypertrophied, as a consequence of the obstruction to the flow of urine and the additional force requisite for its expulsion induced by stricture. This hypertrophy chiefly affects the muscular layer, but does not wholly spare the areolar tissue, which is somewhat thickened and increased in density. The walls of the bladder may attain five or six times their normal thickness, and measure from half an inch to an inch in thickness. The developed fasciculi of muscular fibres form prominent ridges upon the mucous surface, and have been aptly compared to the columnæ carneæ of the heart's cavities. Frequent and violent expulsory efforts cause protrusion of the mucous membrane between these columns, and pouches are formed, which, small at first, may gradually increase in size until they equal or excel the dimensions of the bladder itself. Their devolpment is favored by the fact that they are chiefly composed of mucous membrane with an imperfect layer of muscular fibres, a little areolar tissue and the peritoneum externally, and are therefore thinner, weaker, and less resistant than the proper vesical coats. There are frequently from three to six of these pouches, and sometimes many more; their communication with the bladder is often through a very small opening, which, in a preparation in the London Hospital Museum, does not exceed an ordinary goose-quill; in many instances they contain sandy particles, or fully formed calculi, which may have found entrance from the bladder, or, more frequently, are developed in the cavity. Rupture of their walls, escape of urine into the abdominal cavity, and consequent death, have been known to occur.[2]

The imperfect evacuation of the bladder, in cases of stricture, and the consequent partial retention and decomposition of the urine, maintain the lining membrane in a state of chronic inflammation, which manifests itself, as in other mucous tissues, by hypertrophy, abnormal vascularity, increased secretion, and great irritability. On post-mortem examination, the mucous membrane of the bladder is found to be thickened, soft, and pulpy; its color is heightened,

[1] Thompson, The Enlarged Prostate, its Pathology and Treatment, London, 1858, p. 58. Adams, The Anatomy and Diseases of the Prostate, London, 1853, p. 46.

[2] Preparation in George's Hospital Museum, No. S 21. (Thompson.)

generally of a dark-red hue, and much congested in patches; its surface is smeared with slimy mucus, which, when mingled with the urine, may obstruct the narrow orifice of the stricture; scattered over it is a quantity of fine calculous matter, or it is covered with lymph, sometimes in small patches, at others, in layers of considerable extent.

The irritability of the bladder excites to frequent acts of micturition, and the capacity of this viscus, never fully distended, is eventually much diminished. Instances are recorded in which it would not contain more than an ounce, or even half an ounce, of fluid. When it has existed any length of time, this condition is but very imperfectly remediable, even if the stricture which caused it be successfully dilated, and the patient can never after have due control over his bladder. In exceptional cases, a contrary condition is produced; if little or no irritability of the bladder be present, the impediment to the flow of urine may cause constant distention of this viscus, and its capacity be increased, instead of diminished; in either case its walls are hypertrophied.

Ureters and Kidneys.—As a stricture obstructs the exit of urine from the bladder, so it cannot but impede the passage of fluid into it; consequently we find changes in the ureters and kidneys similar to those already described. The former are often so dilated that they will admit the finger or thumb, and, in some instances, have been mistaken for a portion of the small intestine; their parietes are thickened, and lymphy deposits, and other evidences of chronic inflammation are found upon their internal surface. The kidneys may participate in these lesions; the pelvis, infundibula, and calices, are distended; the medullary tissue of the organ is atrophied under the pressure to which it is subjected, and enormous reservoirs may be formed, capable of containing five, ten, and, in one instance, observed by Mr. Thompson, twenty ounces.

Genital Organs.—Stricture is not unfrequently attended with hypertrophy and induration of the penis, and tumefaction and œdema of the prepuce. These lesions cannot be explained in an entirely satisfactory manner. Hypertrophy may be accounted for in many cases by the traction which patients suffering with stricture are wont to exercise upon the penis, but this does not explain the induration; and, in some instances, both hypertrophy and induration are present, when the habit referred to has not been practised. A similar condition of the parts is met with in certain affections of the prostate and neck of the bladder. Civiale[1] ascribes it to prolonged

[1] Op. cit., p. 141.

and frequent efforts to urinate, which obstruct the venous circulation, and maintain a state of chronic irritation or inflammation. The sympathy of the genito-urinary organs, one with another, has also, probably, some influence. The tumefaction of the prepuce is sometimes sufficient to require scarification.

The ejaculatory ducts may be dilated; their walls, and those of the vesiculæ seminales, inflamed and thickened; and their cavities contain pus, and other products of inflammation.

There is often considerable irritability of the testicle, and attacks of epididymitis sometimes occur, especially after the use of instruments within the urethra. Velpeau[1] draws a distinction between epididymitis dependent upon gonorrhœa, and the present form; and states that in the latter there is rarely effusion into the tunica vaginalis, and that the inflammatory symptoms, which are much less severe, usually disappear in five or six days, even without treatment. In my own practice, I have not found this difference to obtain. One of the most severe and obstinate cases of swelled testicle I ever saw, was due to the use of bougies in the treatment of stricture; and I have met with others which have been very far removed from the mild character described by Velpeau.

Constitutional Effects.—A person laboring under stricture in one of its more aggravated forms, is generally subject to more or less impairment of the digestive and nutritive organs. His appetite is defective; his digestion imperfectly performed; his tongue coated; he loses flesh and strength; has frequent attacks of chilliness, which sometimes assume a periodic type; complains of pain and disagreeable sensations in various parts of the body, most frequently in the perineum, back, loins, thighs, and often in the sole of the foot; he is low-spirited and anxious, and may eventually become a confirmed hypochondriac. To understand how stricture can affect distant organs, it is only necessary to recall to mind the importance of the renal secretion as a depuratory agent of the system; and also the intimate connection which exists between the perfect working of all parts of the animal economy, whereby any defect in one is speedily manifested in others. It is evident from a consideration of the organic lesions which stricture induces in the bladder, ureters, and kidneys, that the secretion of urine must be seriously interfered with, and the perfect elimination of effete matter consequently prevented; and it is also probable that more or less noxious material is absorbed from the partially decomposed urine which collects in

[1] Dictionnaire de Méd., t. xxix., p. 465.

the bladder and elsewhere. The inevitable effect of this upon the system at large, and especially upon the nervous centres, is too well known to require explanation. The solidarity of the genito-urinary and other organs is nowhere more evident than in ophthalmic practice. Instances in which certain forms of eye disease, as asthenopia or choroiditis, coexist with, and clearly depend upon, an affection of the urethra, vagina, or uterus, are so common, that the experienced oculist never fails to interrogate his patients respecting the condition of the latter organs, being convinced that no treatment of the eye disease can be successful, unless these be in a state of health. The same sympathy which here exists between the genito-urinary organs and the eye, must also extend to other parts of the system.

SYMPTOMS OF STRICTURE.

One of the earliest symptoms of organic stricture is generally a gleety discharge from the urethra. If the contraction of the canal has immediately succeeded an attack of gonorrhœa, the urethra may never have recovered its normal condition since the acute symptoms were present; but in some instances all traces of muco-purulent matter have entirely disappeared, or at least have not for some time attracted the notice of the patient, when suddenly, perhaps after some excess, the linen is found again stained, or the lips of the meatus adherent. The discharge, under these circumstances, may present all the varieties, in respect to character and the time of its appearance, already mentioned in connection with gleet. It may be constant, and sufficiently copious to soil the linen; or very slight, and only perceptible on rising in the morning. It may be aggravated by violent or prolonged exercise, sexual intercourse, alcoholic stimulants, or atmospheric changes, and become so abundant and purulent as to lead to the supposition that a fresh clap has been contracted; and though, under favorable circumstances, it may nearly or quite disappear for a time, yet it soon returns, and does not permanently yield to the ordinary treatment of gleet. This discharge is not a constant symptom of stricture, but is present in the great majority of cases. It is chiefly derived from the contracted portion of the canal, and the parts lying directly behind it, which are almost invariably the seat of chronic inflammation, and are more or less modified in their vitality.

Another early symptom, and sometimes the first which attracts the notice of the patient, is a gradual diminution of the power, which,

in a state of health, he possesses over the bladder in respect to micturition. He is not able to retain his water as long as usual, and a desire to urinate calls him up several times during the night. He attempts as usual to accomplish the act, when he finds that he must wait and make repeated efforts before the urine appears; the stream, moreover, is diminished in fulness, is projected with less force than natural, and may be variously distorted; sometimes it is flattened, at other times spiral like a corkscrew, forked, or divided into two or more portions which diverge from the meatus; or, at the same time that a small stream issues from the canal, a portion falls in drops at his feet; he is obliged to take special care to avoid soiling his shoes and clothes; and, finally, when he supposes the act fully accomplished, a few drops dribble away, and wet his person and his clothing. The above symptoms cannot be regarded as pathognomonic of organic stricture, since they may be produced by other causes, as the presence of inspissated mucus in the canal, spasmodic contraction, calculi, irregular action of the bladder, etc.; still they are valuable indications, especially when persistent, and are generally, though not always, proportioned to the degree of the coarctation.

At the same time, each passage of the urine is attended with pain and disagreeable sensations, which vary in intensity, position, and character. Most frequently there is a sense of dull aching in the perineum, back, and loins, or in the glans penis; often pain of a sharper character is felt in the course of the urethra or at the neck of the bladder, or follows the course of the spermatic cord, and is most severe in the groins and testicles, while sometimes it shoots down the thighs. Another frequent seat of pain is behind the pubes, where it is probably due to some degree of inflammation of the bladder. In short, a condition of morbid sensibility exists in the urinary organs, and in the parts connected with them either by continuity of tissue or a common nervous supply.

As the disease progresses, all the above symptoms are aggravated; and the urgency of micturition, especially, is much increased. Frequently, the patient is almost wholly deprived of sleep by repeated calls to urinate, and the length of time which this act requires. In aggravated cases, the urine dribbles away in small quantities, while the patient is asleep, or without his consciousness during the day; and he is first made aware of its passage by the wetting of his person. This has sometimes been mistaken for incontinence of urine; whereas it is almost invariably due to distention of the contracted bladder and overflow of its contents. The urine also undergoes

certain changes in consequence of its retention and partial decomposition, and the vesical inflammation which is thereby excited. It is generally alkaline in its chemical reaction, of an offensive odor, cloudy, mixed with slimy tenacious matter which adheres to the sides of the vessel, and deposits on cooling a pale precipitate, which is found under the microscope to consist of crystals of the triple phosphate, epithelium scales, and pus-globules. This condition of the urine is highly favorable to the deposition of calculous matter; fine sand is often contained in the last portion of urine that comes away in micturition, and excites a scalding sensation in the urethra; or calculi are formed, which may be retained in the bladder or become impacted in the dilated portion of the canal behind the stricture.

Hæmaturia, which, however, is seldom excessive, sometimes occurs in connection with stricture, and is most frequently met with in old and aggravated cases in which the mucous membrane of the urethra is much congested. It chiefly follows the use of instruments which have probably wounded some vessel; or the vascular tissues may be ruptured during the turgescence of erection; or, again, it may occur without appreciable cause. Sometimes, also, blood in small quantities is discharged from the mucous membrane of the bladder. These two sources of hemorrhage may generally be discriminated. If the blood come from the bladder, it is uniformly diffused through the urine, to which it communicates a dark color, or the latter portion of the stream is still more deeply tinged and contains broken clots; frequently, also, there is pain and sensibility on deep pressure above the pubes. If it come from the urethra, it is found in the form of clots alone, or it may flow from the canal independently of the passage of the urine.

The *genital functions* may be variously interfered with. In consequence of the irritation of the parts, frequent erections may take place, or nocturnal emissions occur. In other cases, erection is never perfect, owing to the rigidity of the urethra, or an obstruction to the entrance of blood into the corpora cavernosa; pain is felt in sexual intercourse; and the semen, instead of being at once ejaculated, slowly dribbles away, or passes backward through the dilated urethra into the bladder; hence, persons with stricture are frequently impotent. Civiale remarks that ejaculation is followed by a momentary improvement in the power of urinating, but that the patient is left in a state of exhaustion, which frequently does not disappear for twenty-four hours.[1]

[1] Op. cit., p. 167.

Hæmorrhoids, prolapsus ani, and irritation about the rectum, which is occasionally severe, are often occasioned by the repeated and violent straining required in emptying the bladder, and are thus indirectly symptoms of stricture. In a similar manner, hernia is liable to occur, especially in old men, and is a source of great annoyance, owing to the difficulty of retaining the gut in place.

Retention of urine sometimes supervenes in the early stages of organic stricture, in consequence of congestion and spasm; it may indeed, in rare instances, afford the first indication to the patient that he is the subject of stricture; but in most cases it appears at a later period, when the obstruction to the passage of urine is already very great. It generally follows exposure to wet or cold, a long ride or drive, and, most frequently, a hearty meal, at which alcoholic stimulants have been freely indulged in, the kidneys stimulated to excessive secretion, the bladder distended, a tendency to congestion induced, and the urine long retained; when, on attempting to urinate, the patient finds that he is utterly unable to pass water, or only in such small quantities that the bladder is not relieved from the internal pressure of its contents. The first few attacks of this kind may perhaps be remedied without much difficulty by the passage of a catheter, a hot bath, etc.; and some patients, who are subject to retention, learn to relieve themselves, and carry an instrument habitually with them for the purpose. Sooner or later, however, with the progressive contraction of the stricture, an attack of a far more serious character occurs; former means of relief are tried and found inefficient; the bladder becomes more and more distended, and, unless incapable of dilating through excessive thickening and contraction of its walls, rises above the pubes, and forms a tense, ovoid tumor, which may reach as high as the umbilicus. The situation of the patient is now exceedingly critical; violent and fruitless efforts are made to urinate; pain already felt from the commencement of the attack along the course of the urethra, above the pubes, in the perineum, back and loins, becomes more general and more intense; the body is covered with profuse perspiration and emits a urinous odor; the face is flushed and anxious; the eyes injected; the whole aspect of the patient is one of terror and despair; and, unless relief be obtained, the scene closes, in a few days, with delirium, coma, and death. The suffering induced by severe retention of urine surpasses the power of language to depict; one only who has felt, or often witnessed it, can fully appreciate the agony.

Distention of the bladder, in such cases, may even produce rup-

ture of the vesical walls. Two cases are reported by Sir Everard Home, two by Mr. Thompson,[1] and one in a recent number of the *Medical Times and Gazette*.[2] If the peritoneum be involved in the rent, the urine gains entrance to the abdominal cavity; the vesical tumor disappears, but the bowels are generally tense and swollen, and death soon occurs from peritonitis. More commonly the peritoneum is spared, and the contents of the bladder are at first effused into the sub-serous cellular tissue, where they may cause extensive gangrene of the surrounding parts, or whence they may afterwards escape into the abdominal cavity by ulceration. In no case of rupture of the bladder from retention, has the patient been known to recover.[3]

Still more frequently, the distention of the bladder produces rupture of the urethra behind the stricture, where its walls are weakened by chronic inflammation and ulceration. In the sudden and extensive infiltration of urine which ensues, no time is given for adhesive inflammation to erect barriers to its progress, as often happens in the slower formation of urinary abscesses, and thus the urine, forced on by the contractile power of the bladder, permeates the loose cellular tissue, wherever it is not limited by the fasciæ, the influence of which in determining the course of urinary infiltrations has already been described. When the rupture takes place anteriorly to the triangular ligament, the effusion extends forwards and upwards into the scrotum and over the abdomen; its extent may generally be defined by the swelling and discoloration of the integument, and an emphysematous crackling on pressure, which is due to the mixture of gases with the fluid; the vascular connection between the superficial and deeper tissues is cut off or impeded, and, unless free incisions be made, gangrene of extensive portions of the skin may ensue. Thus, cases are recorded, in which the effusion perforated the superficial perineal fascia and extended down upon the thighs, and in which the greater part of the integument from the knee to the umbilicus, including the coverings of the penis and scrotum, sloughed away, and left the testicles entirely exposed, and suspended only by the spermatic cords, and vessels; yet, even under these circumstances, recovery has been witnessed.

When rupture takes place posteriorly to the triangular ligament, the symptoms may for a time be obscure: as when occurring elsewhere, the patient often has the sensation of something giving way, and experiences temporary relief from his sufferings; if the rent be

[1] Op. cit., p. 351. [2] For Feb. 11, 1860. [3] THOMPSON, op. cit.

large enough to allow of the free escape of urine, the vesical tumor subsides, and, the tension of the parts being relieved, the patient may be able to pass water, but the quantity thus evacuated or drawn off is found to be small; soon deep throbbing pain is felt in the perineum, and symptoms of general depression set in; and the urine, after burrowing in various directions, may approach the surface. A symptom, which is to be regarded as of very serious import, is the appearance of a dark spot upon the glans penis, which indicates that the infiltration has gained access to the corpus spongiosum urethræ, and that gangrene has already commenced.

CAUSES OF STRICTURE.

A knowledge of the causes of stricture, and the relative frequency of their action, may best be attained from an analysis of a large number of cases, such as is furnished in the following table prepared by Mr. Thompson. It should be observed that 143 of these 220 cases were collated from the records of University College Hospital, London, and 49 from reports by different surgeons in medical journals; they may, therefore, be regarded as free from any preconceived notions as to the etiology of stricture, and in a high degree trustworthy; at the same time, occurring for the most part in hospital practice, they represent the worst class of urethral contractions.

ANTECEDENTS, OR SUPPOSED CAUSES OF 220 CASES OF STRICTURE.[1]

Gonorrhœal Inflammation in	164
Injury to Perineum	28
Cicatrization of Chancres or Chancroids	8
Ditto, following *Phagedæna*	1
Congenital, including cases in which the urethra may have been small from malformation, and those in which marked irritability of the urinary organs existed from childhood, accompanied by an unusually small stream	6
Poisoning by Nitrate of Potash,[2] *Lithotrity*, *Masturbation*,[3] of each one	3
True Inflammatory Stricture, including temporary stricture and retention from sudden acute inflammation, usually caused by some excess, and disappearing by resolution	8
True Spasmodic Stricture, caused by irritation about the rectum	2
" " " no cause assignable	2
" " " caused by undue acidity or alkalinity of the urine	3
	220

[1] THOMPSON, op. cit., p. 124. [2] Medical Times, June 22, 1844.
[3] LALLEMAND, Clinique Médico-Chirurgicale, 1re part, p. 109.

Of the 164 cases attributable to gonorrhœa—

In 90 the disease is reported to have been *chronic*, or *neglected*.

" 8 it was attributed by the patients to strong injections.

" 6 the discharge is stated to have ceased entirely and rapidly under treatment; but in five of these stricture appeared almost immediately after.

" 4 other cases the stricture appeared to be almost simultaneous with the gonorrhœa.

In the remaining 61 there is no report of chronicity, etc.

Of the 164 cases attributable to gonorrhœa—

10 appeared immediately after, or during the attack;
71 " *within* 1 year of its occurrence;
41 " *within* 3 or 4 years;
22 " *within* 7 or 8 years;
20 are reported at periods between 8 and 20 to 25 years.

It appears from the above table that gonorrhœa holds the first, and injuries of the perineum the second rank in the etiology of stricture; and this inference is confirmed by the universal experience of the profession at the present day. In a treatise on venereal diseases, it will only be necessary to consider the former of these causes, and the minor influence exerted by the cicatrization of venereal ulcers in the production of stricture.

I. Commencing with gonorrhœa, let us ascertain, if possible, under what phases or circumstances this disease terminates in stricture. Here, again, Mr. Thompson's statistics accord with the observation of every surgeon, that urethral contractions are favored by the long continuance, rather than the severity, of urethritis. If we omit the 61 cases of the above table in which there is no report of the duration of the preceding gonorrhœa, we find that, in nearly nine-tenths of the remainder, the urethral inflammation, to which the stricture was attributable, was either chronic, or neglected. Inquiries addressed to patients laboring under stricture show that, in the great majority, the urethral contraction has been preceded by several attacks of gonorrhœa; but, whether by one or more, that the last was prolonged for many weeks or months, and terminated in a gleet. This coincides with what is observed in other mucous canals; organic contractions of the lachrymal passages, of the œsophagus and rectum, are rarely, if ever, produced by acute, but almost invariably by chronic, inflammation; whatever inflammatory products are effused in the former are albuminous, and admit of ready absorption, while those of the latter are fibrinous, and tend to become organized and permanent.

This view is also supported by the fact that the most common seat of stricture is at a distance of four or five inches from the

meatus, since gonorrhœal inflammation during the acute stage is usually confined to the neighborhood of the fossa navicularis, while gleet affects the deeper portions of the canal, as shown by daily experience, and also by the post-mortem examinations of Rokitansky and Mr. Thompson, who state that they have most frequently found the *bulb* the seat of chronic inflammation. The greater vascularity of this portion of the canal should be taken into account in this connection, since "the amount of inflammatory effusion may be assumed to correspond with the amount of blood supplied;" and this will perhaps explain why stricture is not more frequently situated in the membranous region.

If the ground here taken be correct—of which I think there can be no doubt—it may be assumed that whatever prolongs the duration of gonorrhœa, tends to produce stricture; among the indirect causes of stricture, therefore, may be enumerated a strumous, rheumatic, or gouty diathesis, imprudence in diet, indulgence in coitus, prolonged or violent exercise, acidity of the urine, irritability of the urethra resulting in repeated spasmodic contractions, etc. The influence of all these causes in aggravating urethral inflammation is either sufficiently obvious, or has been dwelt upon in the chapter upon gonorrhœa, and need only be alluded to at present.

Laceration of the urethral walls during chordee, and wounds from the imprudent use of sounds, catheters, etc., require a passing notice. The former may occur spontaneously, or arise from the habit, more prevalent among Frenchmen than Americans, of relieving chordee by forcibly extending the penis; or, as is said, "breaking the chordee." Thompson states that he has met with an occasional example of stricture originating in this manner; and, judging from the violent hemorrhage which sometimes follows this procedure, it may doubtless lacerate the canal to such an extent as to produce this effect. Wounds of the urethra by instruments from within evidently have the same effect as from without; in the process of cicatrization which ensues, the natural coaptation of the parts must frequently be lost, and fibro-plastic material endowed with contractile properties be deposited.

The origin of gonorrhœa does not affect its liability to produce stricture, except so far as it influences its duration. Urethral contractions are as likely to follow urethritis occasioned by leucorrhœa, the menstrual fluid, acrid vaginal secretions, excess of venery, etc., as when the same disease is dependent upon direct contagion. This statement is founded not merely upon a belief in the simple nature of gonorrhœa, but upon observation; and there is not, moreover,

the slightest evidence that the plastic material of stricture (except in a class of cases to be mentioned presently) is of a specific character, nor is it influenced by the internal administration of mercury, which speedily acts upon the specific induration of secondary syphilis.

A class of cases is referred to by Mr. Thompson, as of occasional occurrence—though less frequent than is commonly supposed—in which organic stricture appears at a late period of life, when there has been no urethritis for very many years before; and the question is asked whether any relation exists between the two in the way of cause and effect. Mr. Thompson adopts the probable explanation, that a predisposition to congestion and inflammation may remain after an attack of gonorrhœa in youth, and be kept up by free habits of living, frequent exposure to atmospheric changes, an acrid condition of the urine from dyspepsia or gout, or by other causes, and finally result in the slow development of stricture, which does not manifest itself until many years after the acute attack.

Much influence in the production of stricture has been attributed to the use of injections. I feel obliged to dissent *in toto* from this opinion, which appears to me to be based alone upon reasoning *post hoc ergo propter hoc.* It is asserted in its support, that the greater number of patients with stricture have employed injections for the preceding gonorrhœa; but even if this were proved to be true by the necessary statistics, it would not be conclusive to establish a connection between the two, while injections continue, as now, to be the favorite treatment of clap; it would rather prove that stricture follows gonorrhœa, which is incapable of being cured by injections But that the statement referred to is an exaggeration—at least so far as concerns strong injections—may, I think, be fairly inferred from the above table of Mr. Thompson, in which it appears that of the 164 cases of stricture attributable to gonorrhœa, in only three "was it stated by the patients that they attributed the complaint to their use, notwithstanding the disposition which patients commonly manifest to refer the cause of their disease to any particular mode of treatment, rather than to their own indiscretions, while in by far the larger proportion it was stated that their previous gonorrhœas had not been combated by any kind of injections."[1] When made very strong, or used at an improper stage of the disease, or with excessive force, they may doubtless act as escharotics, or aggravate the inflam-

[1] THOMPSON, op. cit., p. 116

matory action, and thus favor urethral contraction, but this effect pertains alone to their abuse. At the present day, however, this prejudice against injections may be regarded as nearly exploded; the most eminent modern surgeons employ them in their practice and highly recommend them, and I am happy to quote in their favor so high an authority as Mr. Thompson, who would naturally look at the subject from its stricture aspect, and whose opinion may therefore be regarded as unbiassed by any partiality for the use of injections in gonorrhœa. This surgeon says: "I have no hesitation in asserting that the proper employment of injections is one of the best modes of combating urethral inflammation, especially in the chronic form, and thus of preventing the occurrence of stricture."

II. A chancre or chancroid, like any other ulcer, destroys a certain portion of the tissues upon which it is situated, and this loss of substance is not restored in the process of cicatrization, but the gap is filled with fibro-plastic deposit, in the form of granulations, which gradually contracts and approximates the edges of the original sore, or which forms a hard unyielding cicatrix between them. In this manner venereal ulcers situated upon any portion of the urethral mucous membrane may lay the foundation of stricture. Examples are most frequently seen in sores upon the margin of the meatus, and the more destructive the ulcer, the greater the liability of the urethral orifice to become contracted; hence chancroids, and especially phagedenic chancroids, are more to be feared than chancres, since the latter, as a general rule, are more superficial. The same cause of stricture may sometimes be recognized within the canal at a greater or less distance from the meatus, and it is extremely probable that it exists in other cases which are mistaken for simple gonorrhœa, although the discharge is really due to a concealed ulcer.

Though a chancre upon the urethral mucous membrane may not occasion sufficient loss of substance to produce a stricture in the manner now described, yet it possesses another attribute capable of effecting the same result. The specific induration which underlies it and surrounds it, may destroy the normal elasticity of the urethral walls and present a serious obstacle to the flow of urine, and the introduction of instruments. Several instances of this kind have been observed by Ricord.[1] In some cases, doubtless, a stricture may be due to both these causes combined, viz., the cicatrix of an excavated ulcer, and specific induration.

[1] Hunter and Ricord on Venereal, 2d ed., Phil., 1859, p. 172.

DIAGNOSIS.

The general symptoms alone might be considered sufficient to indicate a case of stricture, but in many instances are very deceitful. There are other affections of the urinary organs, the symptoms of which closely resemble those of stricture, and which have often been mistaken for it. Experience, therefore, would show that the greatest care should always be employed in forming a diagnosis. The diseases which are most likely to be confounded with organic stricture, are subacute inflammation of the prostate, and urethral neuralgia and hyperæsthesia, which have received due attention in other chapters of this work. I merely desire at present to glance at a few important points.

Subacute inflammation of the prostate may be attended by nearly every symptom, which has been described as belonging to stricture, viz., by frequency and difficulty of micturition, gleety discharge, and pain in the perineum, above the pubes, and elsewhere. This identity in the symptoms may readily lead to a mistake in diagnosis, which may even be confirmed by a superficial exploration of the urethra; for the prostatic portion of the canal, in this affection, is exceedingly sensitive and the introduction of a catheter attended with severe pain; if, then, the surgeon yields to the feelings of the patient and fails to make a thorough examination, or, if he employs a fine sound or bougie, the point of which is liable to be obstructed by catching in some lacuna of the mucous membrane, the erroneous conclusions already drawn from the history of the case, may apparently be confirmed.

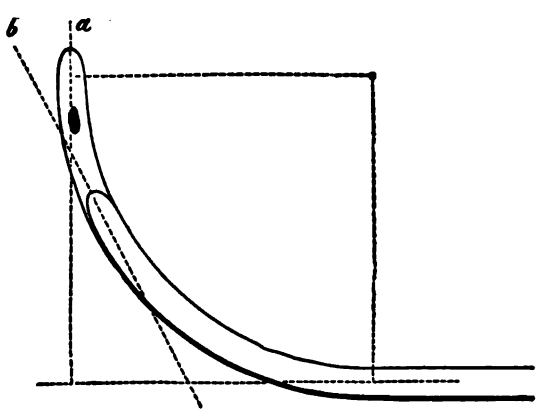
The same mistake may also occur in cases of urethral hyperæsthesia, either when occasioned by sympathetic irritation from stone in the bladder, affections of the rectum, etc., or when, in the absence of any apparent cause, the exalted sensibility can only be attributed to nervous derangement. The diagnosis of a suspected case of stricture can, therefore, only be founded upon a careful and thorough exploration of the urethra, and the instruments required in such examination, and the manner of using them, will now claim our attention.

Exploration of the Urethra.—The instruments requisite for physical exploration of the urethra and the diagnosis of stricture are a set of catheters or sounds—and preferably both—ranging from No. 1 to No. 12 or 15 of the catheter scale in ordinary use; a good supply of gum-elastic bougies, and several sounds with bulbous points.

Catheters are best constructed of virgin silver, which permits of their being bent to any desired curve. They are conveniently made somewhat longer than the canal they are designed to traverse, and usually measure about eleven inches. The surgeon should possess a prostatic catheter which is at least fifteen inches in length. The handle of the catheter is provided with a firm oval ring attached to each side, in order that the least twisting of the instrument on its axis after its introduction may be at once manifest to the operator; and also to permit of its being retained as a permanent catheter. The vesical extremity of the instrument has two eyes for the escape of urine, one situated half an inch, and the opposite one an inch from the extremity. They are often made too large, and allow of the protrusion of folds of the lining membrane of the canal, obstructing the passage of the catheter, and exciting unnecessary pain. Their edges should be bevelled off with nicety. Instead of these two lateral eyes, the end of the catheter is sometimes pierced with numerous small apertures, which are objectionable on account of their liability to become clogged with blood or mucus.

The degree of curvature of this and other instruments used in urethral exploration is a matter of no small importance. It would seem desirable that the curve should correspond to the natural curvature of the least movable portion of the urethra itself, which is that portion underlying the symphysis pubis. Mr. Thompson has adopted this principle in the construction of catheters, and his

Fig. 17.



example has of late been very generally followed, since it has been found that experience confirms the deductions from theory, and that urethral instruments with such a curvature are most readily intro-

duced. When speaking of the anatomy of the urethra, the sub-pubic curve was described as an arc of a circle three and a quarter inches in diameter, the chord of the arc measuring two inches and three-quarters. The accompanying figure from Mr. Thompson exhibits a catheter and sound so bent as to correspond to this curve.

In order that the precise direction of the point of the instrument may be indicated by the direction of its shaft, it is desirable that a constant relationship should exist between the two. According to the principle of construction here recommended, this is a right angle in the catheter, and in the sound, a somewhat shorter instrument, an angle of 120°, or a right angle and a third.

It is desirable to have one or more catheters graduated in inches and fractions of an inch, in order to measure the depth at which strictures are situated, and to determine the length of the urethra; when used for the latter purpose, the graduation should commence with the terminal opening, and not from the extreme point.

Gum-elastic catheters, which may be rendered stiff by a stylet, are sometimes used, but are not so generally applicable as those of silver.

An ingenious substitute for a catheter available upon an emergency, has been proposed by Dr. Stearns, of N. Y., and consists simply of a piece of ordinary bell-wire doubled upon itself and bent tc a proper curve. If this be introduced into the bladder, the urine will escape between and at the side of the two wires.

Sounds of solid silver are the best, but too expensive. They are generally made of steel, which should be pure and highly polished, to avoid the action of rust. To answer this requisite they are sometimes silver plated, but this does not afford reliable protection and it is better that they should be "polished in oil" rather than burnished. The handles of sounds should be broad and roughened, so as to afford a firm hold to the hand, and indicate any deviation in the direction of the point. As sounds are not intended to enter the bladder, except for the occasional purpose of ascertaining the presence of stone, they may be half an inch shorter than catheters, bat should follow the same curve.

Béniqué's sounds have a double curve corresponding nearly to the two curves of the urethra when the penis is not elevated against the pubes, and, in short, are of the same shape that a flexible bougie assumes when introduced into the bladder and abandoned to itself. I am very partial to these instruments, and have a set in my office for common use, graduated according to Charrière's *filière*, in which each sound exceeds the preceding by one-third of a millimètre in

diameter. Since it is rarely, if ever, desirable to employ a metallic sound in strictures which are very much contracted, the lowest number of the set is 12, or one four millimètres in diameter; the highest being No. 30, or ten millimètres in diameter. All numbers below 12 are supplied by gum-elastic bougies. In the dilatation of stricture, a set of instruments like these, increasing in size more gradually than those in common use, is extremely desirable.

Bougies are made of wax, whalebone, elastic gum, and other materials, and terminate at the extremity in a blunt, conical, fusiform, or olive-shaped point. Gum-elastic bougies are generally preferable, except for very narrow strictures, where those of catgut or whalebone are employed, as firmer and less liable to bend or break. In the absence of other kinds, the surgeon may manufacture wax bougies by soaking a piece of fine linen, of suitable length and width, in melted wax, and afterwards rolling it upon a hard surface into a cylinder. Bougies thus constructed are especially convenient for applying caustics to strictures.

A twisted or corkscrew form may be imparted to the extremity of a bougie by winding it round a wire and retaining it in place for a few moments. This form is of great value when the opening in the stricture is at one side of the centre of the canal. It was first recommended by Leroy d'Etiolles,[1] and whalebone bougies of this shape are always employed by Dr. Phillips in difficult cases.

I am partial to olive-pointed bougies, which are introduced with great ease and freedom from pain, a matter of some importance with nervous patients, or when the urethra is very sensitive. The contraction posterior to the olive-shaped extremity is also well adapted to carry to the deeper portions of the canal any lubricating or medicinal substance with which the bougie is smeared.

All bougies, and especially those made of fragile materials, should be carefully examined from time to time, and if found impaired in the slightest degree should at once be destroyed, lest they be incautiously used and a portion break off in the canal. Bougies of elastic gum become rough with use, whereby they irritate the mucous membrane, and should, in this case, also be discarded. Whalebone bougies must be oiled occasionally, or they become brittle and unsafe.

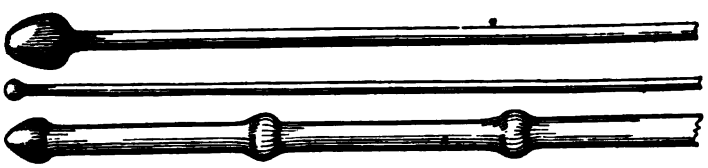
Bulbous sounds, made of steel, are serviceable in determining the extent of a stricture from before backwards, and also in ascertaining if a second stricture exists posterior to one already discovered.

[1] Sur les Avantages des Bougies Tortillées et Crochues dans les Rétrécissements et Angusties de l'Urètre difficiles à franchir, Paris, 1852.

It is desirable to have several of them on hand, with the diameters of the bulbs varying from Nos. 1 to 6 of the catheter scale. At the suggestion of Dr. Geo. A. Peters, of this city, Messrs. Tiemann and Co. have recently manufactured a bulbous sound with a fine stem, upon which bulbs of different sizes may be screwed. The staff should be graduated in inches, commencing with the upper surface of the bulb, which is abrupt in this direction. The distance of the anterior edge of the stricture from the meatus having been measured upon a graduated catheter, a bulbous sound is passed through the contraction, when the position of its posterior edge can be determined by the bulb catching upon it in a to-and-fro motion imparted to the instrument; the difference in the readings upon the catheter and sound at a point corresponding to the external orifice of the canal will clearly indicate the length of the stricture. This measurement is always desirable to aid in determining the probable duration of treatment, and is almost indispensable when external or internal incisions are employed. Again, the small size of the shaft gives to bulbous sounds, when passed through one contraction, considerable freedom of motion, and enables the operator to explore for strictures more deeply situated.

Bulbous bougies of gum elastic can be introduced with less pain to the patient than bulbous sounds, and are, therefore, to be preferred, especially for exploring the deeper portions of the canal. These and knotted bougies ("bougies à nœuds") are very valuable instru-

Fig. 18.



Bulbous and knotted bougies.[1] (After PHILLIPS.)

ments for detecting a slight degree of contraction, and for determining the comparative sensibility of the different portions of the urethra.

Introduction of the Catheter.—A catheter may be introduced while the patient is in the standing or sitting posture, but the recumbent position is on many accounts the best; the patient lying square on

[1] These and the other instruments mentioned in this work may be obtained of Mr. Geo. Tiemann, 63 Chatham St., N. Y.

the back, with the shoulders elevated, the knees drawn up and somewhat separated, the genital organs entirely exposed, and the surgeon standing or sitting on his left. The operator now raises the penis to an angle of about sixty degrees with the body, thereby effacing the anterior curve of the urethra, by means of the ring and middle finger of the left hand, its palm looking upwards; the thumb and forefinger are thus left free to retract the prepuce and separate the lips of the meatus. The catheter, previously warmed and oiled, is held lightly between the thumb and fore and middle fingers of the right hand, "like a pen," its shaft corresponding to the fold between the abdomen and the left thigh. The introduction of the instrument should be slow, and with the exercise of but very little force; its own weight is almost sufficient to effect its passage if properly directed; if any obstruction be met with, the instrument should be withdrawn for a short distance and again advanced with the direction of its point slightly varied; or if the obstacle be due to spasmodic contraction of the urethra, it may generally be overcome by gentle pressure continued for a moment or two; while passing through the first two inches of the urethra the point of the instrument is inclined to the lower surface in order to avoid the lacuna magna; beyond this it should be directed rather to the upper surface to escape the sinus of the bulb; when it has penetrated beneath the pubis, the shaft is brought round to the median line of the body and parallel to the surface of the abdomen; the handle is now to be elevated to a perpendicular and then depressed between the thighs, when the point will usually glide into the bladder; if any difficulty is met with at this stage of the proceeding, it is probably because the point has caught in the extensible tissue of the bulb, and the instrument should be again raised to a perpendicular and slightly withdrawn, and the penis elongated by traction before the manœuvre is repeated; further assistance may be obtained, if necessary, during the latter part of the introduction, by gently pressing against the convexity of the instrument in front of the anus or by introducing a finger into the rectum, ascertaining the exact position of the point and guiding it forwards and upwards against the posterior surface of the symphysis; the passage of the extremity over the uvula vesicæ is often indicated by nausea or a slight tremor on the part of the patient, and its entrance into the bladder by a flow of urine.

Let us review these several steps, and notice the chief natural obstacles which are to be avoided. The first is the lacuna magna situated upon the upper surface of the urethra; this is to be shunned

by directing the point towards the lower surface during the first two inches of its passage. The second is the symphysis pubis, against which the extremity of the instrument will impinge, if the abdomen be distended and the handle be held in the median line; hence the direction to hold the shaft parallel to the fold of the thigh, and not to bring it to the median line or elevate it until the point has penetrated beneath the symphysis. The third is the sinus of the bulb; the urethral wall is here very extensible, and is readily thrown into a fold upon which the point of the instrument catches instead of passing through the opening in the triangular ligament into the membranous portion; this is less likely to happen if the tissues be stretched by traction upon the penis; and, if it occur, the point is to be disengaged by slightly withdrawing it, and afterwards advanced in a direction more towards the upper surface of the canal. It is to be observed that this is the only stage of the process in which traction upon the penis is desirable; after the point has entered the membranous portion, it is positively injurious. Again, hypertrophy of the prostate or abnormal development of the uvula vesicæ may oppose an instrument in the last part of its passage; this is to be avoided by depressing the handle and thus elevating the point towards the symphysis: in these cases a prostatic catheter is often required.

It is a golden rule in every case of suspected stricture to make the first examination with an instrument sufficiently large to distend the urethra, whatever history of his previous symptoms may be furnished by the patient; in this manner many sources of error already indicated will be avoided. The difference in the impression conveyed to the hand of the operator by mere spasmodic contraction of the urethra and an organic stricture, is very marked, but can be better felt than described. In the former case, the tissues against which the point of the instrument impinges evidently preserve their natural suppleness, and the obstruction yields to gentle and continued pressure; while in the latter, a firm resilient obstacle is felt, which can be thrust backwards, imparting more or less motion to all the surrounding parts; and if, after a trial of one or more smaller instruments, one be found which can be successfully introduced within the stricture, it is grasped or "held" by it in a very characteristic manner. The only phenomenon that at all resembles this, is contraction of the voluntary and involuntary muscles which surround the membranous portion of the urethra, and which are sometimes called into action, especially in irritable subjects, by the presence of a foreign body; but in this case a full-sized instrument

can still be introduced with but slight difficulty; and, if allowed to remain a short time, the obstruction yields, and the catheter or sound is found to be freely movable. Attention to these circumstances will facilitate the diagnosis even if the hand be not educated to distinguish the palpable difference in the sensations.

Model Bougies.—Information of value in some cases with regard to the size and shape of strictures may be obtained from impressions taken upon bougies of wax or other plastic material. Dr. Henry J. Bigelow, Surgeon to the Mass. General Hospital, highly recommends gutta-percha bougies for this purpose.[1] While house-surgeon of this hospital in 1850, I had frequent opportunities of seeing and assisting Dr. Bigelow in taking impressions by this method. The bougies are first prepared by cutting strips approximating to the size desired from a sheet of gutta percha; they are then slightly softened by momentary immersion in hot water, and rolled smooth between two boards, when they may be at once hardened again by dipping them in cold water. From a number thus prepared, one should be selected which will moderately distend the urethra; it is then to be well oiled, and its extremity softened by passing it to and fro over the flame of a spirit lamp or candle; the material will continue plastic after it has ceased to be hot, when the bougie is to be passed rapidly down to the obstruction, firmly pressed against it for a moment, left in place a short time longer to cool, and then slowly and gently withdrawn. The tip will be found to bear an impress of the anterior surface of the stricture and a portion of the canal within it, and will exhibit the position of the obstruction, the size and eccentricity of the opening, etc.; this may be cut off and preserved for future reference, or for comparison with casts subsequently taken. Mr. Thompson[2] objects to this procedure on the ground that in a number of instances a portion of the bougie has been left in the urethra, and has required an operation for its removal; "of which four cases are reported in the *Dublin Medical Gazette*, Jan. 24, 1855." Judging from my own experience, I do not believe this accident is liable to occur with due caution on the part of the surgeon. The gutta percha should be pure and freshly prepared, and its strength can readily be tested at the time it is used; when old it becomes very friable. I have before me some bougies which I made ten years ago, and which are now nearly as brittle as glass, but I have never seen any approach to an accident, when the mate-

[1] Boston Medical and Surgical Journal, Feb. 7, 1849. [2] Op. cit., p. 188.

rial was fresh and prepared in the manner here directed. I would suggest another caution, which is, that the tenacity of gutta percha becomes impaired by frequent contact with the urine, and that bougies of this substance should not be repeatedly used. It may be observed that the "vulcanized rubber," which is now so extensively employed for various purposes, may be softened over a lamp in a similar manner, and would probably make excellent "model bougies." Impressions by means of these instruments often afford useful and interesting information, especially in cases complicated with false passages, but they are not to be regarded as generally necessary.

Strictures of the urethra anterior to the scrotum are often appreciable from the surface in consequence of the amount of firm deposit which surrounds them; and external as well as internal examination is always desirable in order to ascertain the presence of any sinus or abscess in the neighborhood of the canal.

TREATMENT.

Constitutional Means.—It is of paramount importance in the treatment of stricture not to lose sight of the general condition of the system, and particularly of the digestive organs; indeed, without this, local measures, however well directed, will either be greatly obstructed in their action, or will utterly fail to produce any good result. The necessarily injurious influence of even slight irregularity of life continued from day to day, may be inferred from a consideration of the disastrous effects which may be produced by a single excess in wine, exercise, or coitus; if a few glasses of punch, a hearty dinner, or a ride on horseback can occasion urethral congestion and spasm, and consequent retention of urine, it is reasonable to suppose that even moderate indulgence may seriously interfere with any attempt to cure the disease. These deductions from theory are borne out in daily practice, and it is found to be true as a general rule that the more regular the patient's life, the more amenable is his case to treatment.

The constitutional management of stricture must of course vary in different cases. Unless the disease be far advanced, it is generally sufficient to prescribe such measures as will best promote the health, and place the system in the most favorable condition for absorption to take place. Another indication of the highest importance is to lighten the duty imposed upon the kidneys, and render the urine

bland and unirritating to the inflamed surfaces over which it passes, and this is to be chiefly accomplished by regulating the character and quantity of food, and favoring depuration of the blood through other channels, as the skin, bowels, and lungs. The diet should be simple but sufficiently nourishing; alcoholic stimulants, highly seasoned food, cheese, cabbage, salt meats, strong coffee, and all articles which tend to load the urine should be avoided, as also tobacco—unless in great moderation; the bowels should be opened daily, if necessary, by gentle laxatives, but violent purges are to be avoided. The skin should be stimulated by frequent bathing and friction; when there is much irritability of the urethra, the hot hip-bath will be found very beneficial; no more exercise should be taken than is sufficient to maintain the appetite and strength; and, in general, the patient should lead a quiet and regular life. When the urine is alkaline, or contains an undue quantity of lateritious deposit, great benefit will be derived from the compounds of potash and soda with the vegetable acids, as the citrate and acetate of potash, the tartrate of soda and potash, etc. Mr. Thompson recommends benzoic acid in these cases.

In the more severe cases of stricture, especially when the patient has suffered from one or more attacks of retention of urine, it is desirable to confine him to the house or even to the bed for a week or fortnight before commencing direct treatment; and this course becomes necessary when it is proposed to resort to external or internal incisions, or to rapid dilatation.

Some advantage might perhaps be derived from the administration of iodide of potassium, which, when given in the thirtieth dilution, is capable, according to the statement of some homœopaths, of curing all cases of stricture (!); but, so far as I am aware, there is at present no reliable evidence that this or any other article of the Materia Medica can effect absorption of the adventitious deposit of urethral obstructions.[1]

Probably no class of affections has more thoroughly taxed the ingenuity of surgeons to discover some speedy and effectual method of cure, than have strictures; and a volume, the size of the present one, might be filled with the different operative procedures which have been proposed for this purpose; but the limits of this chapter

[1] Since the above was written, I have noticed a statement by Dr. Thielman, to the effect that he has successfully treated twenty-seven cases of stricture by iodide of potassium alone in doses of two and a half grains three times a day. New Jersey Medical and Surgical Reporter, Jan. 1858, from the Medical Gazette of Russia, 1857 This statement requires confirmation.

require that I should confine myself to the strictly practical, and dilate on those methods only which have stood the test of time, and which are generally adopted by the soundest surgeons of the present day; but few of the many which, though extolled for a short period, have soon sunk into forgetfulness, will receive even a passing notice.

DILATATION.—From a very early period in the history of surgery dilatation has held, as it continues to hold, the first place in the treatment of stricture. Unassisted by other measures, it is able to overcome the larger number of urethral contractions; and, when other methods are employed, it is still required to complete and give permanency to the cure. Dilatation may therefore be regarded as an essential element of all treatment; and the greater the importance attached to it by the surgeon, the more satisfactory will be the results attained in practice. The reason of this pre-eminence is to be found in the fact that dilatation accomplishes more perfectly than any other method the removal of the fibro-plastic material which constitutes stricture. Numerous explanations have been given of its mode of action, but the one now generally received, and which is unquestionably correct, is, that, so far as it effects any permanently good result, it acts by promoting absorption. The presence of a bougie within a stricture may mechanically dilate its walls, but sooner or later after the withdrawal of the instrument, the plastic material again contracts; and all the phenomena attendant upon dilatation show that it accomplishes something more than this, and that, like pressure upon external tumors, it possesses the power of producing absorption of inflammatory deposits. At an early period of the existence of stricture, before its constituent elements have become firmly organized, there is reason to believe that they may be entirely removed by the treatment now under consideration; at a later stage, a portion only can be thus dissipated, and it is in these cases that we are forced to be content with palliating the evil by mechanically enlarging the canal from time to time, or, when the contraction is so firm as not to admit of this, by incising or rupturing the obstruction and afterwards stretching the recent fibrinous deposit which forms between the edges of the wound.

The instrument employed in dilatation, whether a catheter, sound, or bougie, is in most instances a matter of but small importance, as may be inferred from the great diversity in the preferences of different surgeons, though the weight of authority is probably in favor of a metallic instrument. Every operator will generally use

that one most successfully to which he is most accustomed; but there are certain cases in which each possesses peculiar advantages. Thus the unyielding material of metallic instruments gives them the preference in firm, indurated strictures which are liable to indent the softer substance of flexible bougies; moreover, being inflexible, they are entirely under the control of the operator, and can be guided with precision in any desired direction; in all cases complicated with false passages they should undoubtedly be preferred. Their disadvantages are a liability in unskilful hands of doing injury to the urethral walls; the terror which they inspire in timid patients, and their inability to adapt themselves to the flexures of the canal, whence their introduction is attended with somewhat more uneasiness than flexible bougies. Granting, however, the possession of that amount of anatomical knowledge, patience, and delicacy of touch, which alone can justify any one in performing catheterism, there is no serious objection to their employment; but flexible bougies are far safer in the hands of those not endowed with these necessary qualifications.

Especially in the first examination of any case, no instrument equals in value the ordinary silver catheter; its entrance into the bladder is surely indicated by the flow of urine through the tube, and its blunt point accurately defines the position of any obstruction. Sounds or catheters when used for the purpose of dilatation, may be slightly conical at the extremity, as this form corresponds to the opening of most strictures and facilitates the introduction of instruments. In a few rare cases of tortuous and contracted strictures it is impossible to pass any instrument except a filiform bougie, which is preferably made of whalebone or of gum-elastic.

The same method should be followed in performing dilatation as in ordinary catheterism. If the first instrument employed will not enter the obstruction, a second and smaller one must be tried; the dimensions of the stream of urine indicating by approximation the actual size required. All attempts to penetrate the narrowed channel should be made with the utmost gentleness, and any sudden thrusting of the instrument especially avoided; force is only admissible when the point is felt to be "held," thereby indicating that it is already engaged in the passage, and even then pressure must be steady, only very gradually increased, and always moderate. False passages are usually found below or at the sides of the urethra; hence, if there be any reason to suspect their presence, the extremity of the catheter should be carefully guided along the upper surface. It often happens, however, that the orifice of the stricture is eccen-

tric, being above or below, or to one side of the centre of the canal; if therefore previous attempts have proved unsuccessful, the direction of the instrument may be varied; or, if a bougie be used, it may be twisted on its axis at the same time that it is gently pressed forwards. Assistance is sometimes afforded, especially in strictures of the spongy and bulbous portions, by passing the disengaged hand down to the seat of the obstruction and exercising a certain degree of pressure externally. In cases of extreme difficulty, Mr. Thompson[1] recommends that the urethra should first be freely injected with olive oil, which is to be retained by compression of the meatus while a small instrument is passed; he believes that thus the stricture is not only thoroughly lubricated, but also somewhat dilated by the mechanical pressure of the fluid, and states that this method has proved of very decided advantage in his hands.

The length of time that the instrument should be retained will depend somewhat upon the sensitiveness of the canal; although here I think a distinction should be made between sensibility attendant upon inflammation and that which is chiefly nervous, the former will be aggravated by the prolonged contact of a foreign body, the latter diminished; as photophobia is in many cases relieved by gradually accustoming the eye to light, so there is no more effectual remedy for nervous irritability of the urethra than the introduction and temporary retention of a catheter, and attention to the circumstances of the case will enable the surgeon to apply these principles to practice. As a general rule five minutes is sufficiently long for the first session, and the period may gradually be extended at subsequent visits to half an hour.

The phenomena following the passage of an instrument through a stricture have been carefully studied by Mr. Thompson, and are both highly interesting and instructive. At the first succeeding act of micturition, the stream of urine is found to be increased in size; in the course of a few hours it diminishes, and is even smaller than before the introduction of the instrument; finally, after a day or two, it is permanently enlarged. Mr. Thompson attributes the first mentioned effect to mechanical dilatation; the second to reactive congestion and spasm; and the third to the subsidence of the latter, and to the removal by absorption of a portion of the organic deposit. The practical deductions from these observations are: that an instrument should not be inserted with such force, nor retained so long, as to excite decided inflammatory action; and that catheterism

[1] Op. cit., p. 179.

should not be repeated until all irritation produced by previous applications has disappeared.[1]

An interval of from two to five days between the applications is usually sufficient. At the second visit, the instrument first employed may be introduced for a moment, then withdrawn, and the next larger size inserted. With very irritable strictures, it is often advantageous to proceed even more slowly than the ordinary catheter scale admits; that is, by instruments intermediate in size between the numbers upon this scale, such as may be found in most collections of bougies. For this reason, the more minute division of the French scale, which is divided into thirds of a millimètre, is an improvement upon the English.

Thus, by a gradual advance, the passage may be enlarged to a calibre corresponding with that of the external meatus, and although this degree of dilatation is usually sufficient, yet it is sometimes desirable to exceed it and to restore the constricted portion of the canal to its original diameter, which can only be done after incision of the unyielding meatus. This is especially advisable in strictures attended by frequent attacks of retention, and which speedily relapse after the cessation of treatment, since it is found that free dilatation with instruments carried in some instances as high as No. 15 or 16, renders the cure much more permanent. Under no circumstances should catheterism be at once abandoned so soon as the stricture is dilated to the desired extent, whatever that may be; but instruments should be passed at gradually increasing intervals, as, for instance, once a week for a short period, then once a fortnight, and so on, until several months have elapsed.

Some strictures prove impermeable on the first trial, and if, after continuing the attempt as long as appears justifiable, success be not attained, it is better to defer farther efforts until a subsequent visit. Attention has already been called to the fact that those surgeons who, like Dr. Phillips, have acquired a reputation for their power in overcoming apparently impassable strictures, attain success as much by their repeated trials and dogged perseverance as by their skill. In cases of "impermeable stricture," especially when attended with much sensibility and spasmodic contraction of the urethra, great advantage will be derived from placing the patient under the influence of an anæsthetic, but the condition of insensibility must not be abused to employ more force than would, under other circumstances, be thought justifiable. Pressure against the face of a stricture,

[1] Thompson, op. cit., p. 210 et. seq.

steadily continued for ten or fifteen minutes, and repeated if necessary on several occasions, will sometimes prove successful, after an attempt to insinuate the instrument within the passage has failed; but care should be taken that its point is really directed against the contraction and not upon the urethral wall in the neighborhood. Excepting those cases in which retention of urine demands immediate evacuation of the bladder, and where no opportunity is afforded for making repeated and persevering attempts at catheterism, the surgeon will meet with but few strictures which he cannot ultimately succeed in overcoming by the dilating process.

Continuous Dilatation.[1]—A more expeditious mode of dilating stricture is by the method known as "continuous dilatation," in which the catheter is retained for a considerable length of time, generally for several days in succession. In the course of twenty-four or forty-eight hours, a purulent discharge appears, proceeding from the abraded or ulcerated mucous membrane at the seat of the obstruction, and the passage is rapidly enlarged.

This method is employed by some surgeons in all cases of passable stricture, but such practice is not commendable, since it is less effective than gradual dilatation in removing the organized material constituting the obstruction; is more likely to be attended by untoward symptoms; and is followed by a strong tendency to recontraction. But although continuous dilatation should be rejected as an exclusive method of treatment, it is extremely valuable, under certain circumstances, as a temporary resort, and as preparatory to the intermittent use of instruments. It is advisable: 1st, when time is of great importance, as with persons from a distance or with seafaring men, for whom much may be accomplished in a few days, and the after-treatment be left to the patient, instructed in passing an instrument upon himself; 2d, when, in narrow strictures or in those complicated with false passages, great difficulty has been experienced in introducing the catheter, and fears are entertained that it cannot be reinserted if once withdrawn; and 3d, when it is found impossible to repeat catheterism except at long intervals, either in consequence of extreme irritability of the urethra, or of rigors following each application. The latter often attend the first succeeding act of micturition, and appear to be due to the contact of urine with the abraded mucous membrane.

In either of the above cases if a catheter can be introduced through the stricture, it may be retained in place by tapes passed

[1] "Dilatation permanente" of the French.

through its rings and attached before and behind to a bandage around the abdomen; its point should not be allowed to project into the bladder sufficiently to injure the vesical coats; its external orifice should be connected with a urinal or fitted with a plug which can be removed whenever a desire is felt to urinate, and the patient should be confined to the bed. Considerable pain and other unpleasant symptoms are often experienced within a few hours, but unless these be severe the catheter should not be withdrawn, as the object in view would be thereby defeated. The strength should be supported by nutritious diet or even stimulants; pain may be alleviated by opiates given by the mouth, or, preferably, in the form of suppositories, and rigors may be met by hot applications to the surface, and opium internally. The occurrence of fits of shivering for the first time after the catheter has remained in for several hours, or the appearance of considerable blood in the urine, are indications that the instrument should be at once withdrawn, and treatment suspended for a few days.[1]

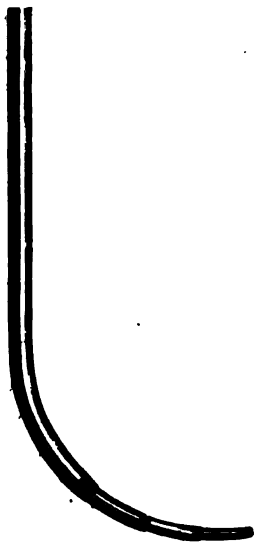
In most cases, the catheter may be retained for twenty-four to forty-eight hours, not longer, lest it become incrusted with calculous deposit, or ulceration of the urethral walls be induced; the patient is then allowed to rest for a day or two, and a larger one inserted. After several such applications, the urethra will generally be sufficiently dilated to admit a No. 8 or 10 instrument without difficulty, but the treatment must not be allowed to rest here; there still remains a strong tendency to contraction, which must be overcome by frequent catheterism repeated at first every day or two, and subsequently at increasing intervals, as after gradual dilatation; by this means only can it be hoped to maintain the ground already gained, and to effect the removal of the contractile material which induces relapse.

Rapid Dilatation.—Continuous dilatation above described, is also in a measure *rapid*, but it accomplishes its object indirectly, while the methods we are now briefly to consider aim directly at the speedy enlargement of the passage.

Rapid dilatation may be effected by means of conical sounds or bougies, the small extremity of which is introduced within the stricture and advanced by gentle but steadily continued pressure until the shaft, which is several sizes larger than the point, is fairly inserted; the instrument may then be allowed to remain for several hours, and a larger one substituted for it.

[1] THOMPSON, op. cit., p. 193.

Fig. 19.



Several instruments invented for rapid dilatation are constructed upon the common principle of a series of tubes varying in diameter, which slide one upon another. In the instrument of Mr. Thomas Wakley, a No. 1 silver catheter is employed as a guide, which is first introduced into the bladder, and the tubes passed in succession over it. When the desired degree of dilatation has been accomplished at any one session, a flexible catheter may be inserted in place of the largest silver tube which has been used, and, the conductor having been withdrawn, be retained until the next visit. From the strong testimony adduced by Mr. Wakley in favor of his method, it would appear to be well worthy a trial in some cases.

In the instrument invented by Dr. Buchanan, of Glasgow, the sliding tubes and a central conducting wire are united into a "compound catheter" (Fig. 19), which is first introduced as far as the obstruction, when the guide is pushed on through it together with as many of the tubes as will effect the desired degree of dilatation. It is stated by Mr. Thompson that this instrument has been claimed as a modern invention in London within the last few years, and such has also been the case in this neighborhood.

M. Maisonneuve has invented an ingenious method of treatment which he calls "cathétérisme à la suite." A very slender and flexible bougie, well adapted to pass the longest and most tortuous strictures, serves as a pioneer; when once this is introduced, various instruments may be screwed to its external extremity and passed through the obstruction following the bougie as a guide, the flexibility of the latter permitting it to be coiled up in the bladder as fast as it enters this cavity. If, for instance, it is desired to draw off the urine, a hollow bougie with an eye upon its side is screwed to the conductor and passed into the bladder, while larger bougies or a urethrotome may be attached for the purposes of dilatation or internal incision.[1] The guide is left in the urethra from one visit to another, so that there is no necessity for repeated

[1] A catheter armed at the point with a bougie was employed for the relief of retention of urine by Dr. Physick, of Philadelphia, as early as 1796. Thompson's probe-pointed catheter is a modification of the same instrument.

introduction. Although this method is beautiful in theory, it cannot be said to have been fully tested in practice. It would appear probable that it may occasionally prove of value, especially in narrow strictures complicated with retention, when it is impossible to introduce any instrument but a filiform, flexible bougie, too small to draw off the urine; and when otherwise it would be necessary to puncture the bladder.

Fig. 20.

A. Filiform bougie. B. Flexible catheter with an opening upon the side, screwed to the former.

Expansion.—Attempts have been made to expand strictures:—

1. By instruments made of some porous material which will dilate when moistened by the urethral secretions. Thus, bougies of "flexible ivory," or ivory deprived of its calcareous matter by immersion in a weak acid, have been used for this purpose by the French; bougies of slippery elm by Dr. Wm. A. McDowell,[1] formerly of Downesville, and Prof. Nathan Smith, of Baltimore; and compressed sponge by Dr. Alquié,[2] of Montpelier, and Dr. Batchelder,[3] of this city. These attempts have not as yet, so far as I am aware, attained any satisfactory result, and in a trial of bougies of flexible ivory made by Ricord, the portion of the instrument which was introduced beyond the stricture dilated to such an extent that it was withdrawn with great difficulty, and the necessity of external incision became imminent.

2. By sacs of oiled silk, gold-beater's skin, or other impervious material, which may be introduced through the stricture by means of a stylet, and afterwards dilated with air or fluid, as proposed by Ducamp, and Dr. James Arnott.[4]

3. By various instruments with expanding blades.

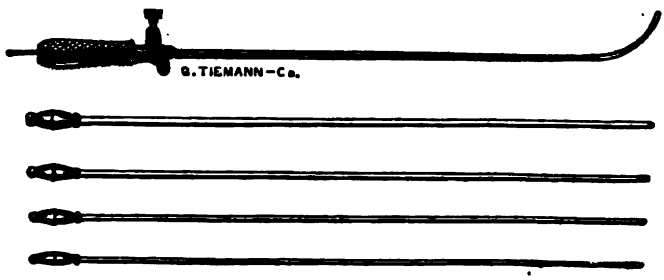
The employment of all these methods has been chiefly confined to their inventors, and cannot be recommended as superior or even equal to other modes of dilatation.

RUPTURE.—Under the name of the "immediate plan," the sudden and forcible dilatation of strictures has been proposed by Perrève,

[1] Gross, op. cit., p. 778.
[2] Gazette des Hôpitaux, 24 Juin, 1854, p. 300.
[3] New York Journal of Medicine, May, 1859.
[4] Stricture of the Urethra, London, 1819.

Mr. Holt, and others. With the very strong testimony adduced in favor of this method, I am happy to reverse the judgment expressed in the first edition of this work, and to state my belief that, in this instance as in many others, experience proves the value of a mode of treatment which at first has been rejected upon theoretical grounds.

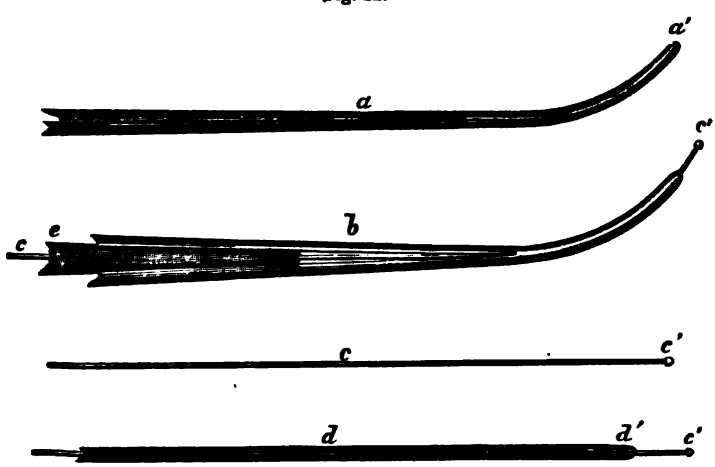
Fig. 21.



Mr. Holt's instrument.

Mr. Holt's instrument, which is decidedly the best, consists of a sound (equalling in diameter No. 3 of the ordinary catheter scale), which is split nearly to the extremity and encloses a central wire, the

Fig. 22.



Mr. Smyly's modification of Mr. Holt's instrument.

(*a*) The dilator closed.

(*b*) The branches slightly opened to show the wire guide in the position of the stilette in Holt's instrument. The dilator (*e*) is not quite pushed to the end.

(*c*) The guide of silver wire.

(*d*) No. 1 catheter, either of silver or gum elastic, to which any curvature may be given

latter serving as a guide to a number of tubes, which may be passed along it with the effect of forcibly separating the blades and rupturing the stricture.

Mr. P. C. Smyly has modified and improved Mr. Holt's instrument by making the central wire (terminated by a small silver button) independent of the rest of the instrument, so that it may alone be introduced through a stricture of very small calibre, and serve both as a guide to a No. 1 catheter for the evacuation of the urine in cases of retention, and to the dilator for the rupture of the contraction.

At a discussion before the Royal Medical and Chirurgical Society, April 14, 1863, Mr. Holt stated that he had now operated in hospital and private practice, upon more than 250 cases, without any complication of either infiltration of urine, abscess, swelled testicle, or inconvenience of any kind, further than the occasional supervention of a rigor, or mild attack of urethral fever; also that the operation did not require either the previous or after retention of a catheter in the bladder, that the administration of an anæsthetic was rarely necessary, that the patient was not confined to the house longer than the afternoon in which the operation was performed, and that the pain was of the most trifling description. If only half of these claims should prove true, this method would be a most valuable one in the treatment of stricture, and it is no more than justice to Mr. Holt to say that it has received the highest encomiums from others than himself.[1]

As these pages are passing through the press, the second edition of Mr. Holt's work (On the Immediate Treatment of Stricture of the Urethra, by the Employment of the "Stricture Dilator") has appeared, giving an account of a very great improvement in the construction of the instrument, which attains the same end as Mr. Smyly's modification. The directing rod is made hollow, with an opening at the back of the curve of the dilator, so that the escape of urine will indicate when the instrument has entered the bladder, and relief is afforded in cases of retention; again, an alteration in the construction of the handle renders it impossible for the tube to escape from between the blades of the dilator.

[1] See "A Retrospect of some cases of Stricture of the Urethra," by J. Smyly, A.B., Dublin Quarterly Jour. of Med. Sci., Nov., 1862; "On the Treatment of Stricture by the Immediate Plan," by Rawdon Macnamara, M.R.I.A., ibid.; "On the Treatment of Stricture of the Urethra by the More Immediate Plan," by Philip Crampton Smyly, M.D., same journal for Feb., 1863; and the report of the Medical and Chirurgical Society's session, April 14, 1863, in the Medical Times and Gaz., May 2, 1863.

I have also had the opportunity of testing Mr. Holt's method in three cases of stricture with the most satisfactory results, and, so far as I can judge from this small experience, I am led to indulge the most favorable opinion of its value.

Mr. Holt recommends, after the rupture of the stricture, that the urine should be drawn off by means of a full-sized catheter, and the patient be sent to bed for the first day and night, during which he should take, every four hours, a mixture containing in each dose two grains of quinine and ten minims of the tincture of opium. The daily use of the catheter should subsequently be continued as after internal urethrotomy.

CAUSTICS.—Caustics, at times extolled as the most efficient means of treating stricture, and at other times decried as useless and in the highest degree dangerous, have succeeded in maintaining a favorable position in the general estimation of the profession; not, however, as an exclusive mode of practice, but as an adjunct to dilatation. It should be observed that these two methods are inseparable, even when not, as is usually the case, intentionally combined; since the instruments employed in the application of caustics must necessarily distend the canal like bougies or sounds. This fact renders it somewhat difficult, in any case of successful treatment in which these remedies have been employed, to determine what proportion of the credit is due to them and what to dilatation; but the general impression upon the minds of those who have given them a fair trial is sufficient to warrant the favorable opinion above expressed; which is founded not only upon the testimony of the warm advocates of this mode of treatment, Messrs. Whately and Wade, but also upon that of Mr. Henry Smith, Mr. Thompson, several personal friends in this city, in whose judgment I place the highest confidence, and my own experience.

It is necessary, however, to define with greater minuteness the position which caustics are believed to hold; and this may be done in the following terms:—

1. They are not to be used as escharotics for the purpose of destroying the plastic material which constitutes strictures; hence of these agents the milder forms should be preferred, or the stronger caustics should be employed in small quantities only.

2. They are especially adapted to cases of irritable stricture, in which they diminish sensibility and spasm, and permit of the freer use of dilatation;

3. To cases in which there is a strong disposition to hemorrhage, in which they control the vascularity of the part; and

4. To some cases of tough and fibrous contractions, in which they appear to assist dilatation by exciting absorption.

The chief caustics employed in the treatment of stricture are nitrate of silver and caustic potash; to the former of which my own experience has for the most part been confined. The mode of application is exceedingly simple. A depression is to be made in the extremity of a wax bougie, in which a small fragment of the solid nitrate is deposited, and the adjacent substance pressed around it, so as partially to overlap it and retain it in place. The instrument is then to be oiled, passed rapidly down to the anterior face of the stricture, or, if possible, within it, retained in position from one to two minutes, and then withdrawn. In the course of three or four days, a plug of coagulated mucus and epithelium may often be detected in the urine, the pain of micturition is lessened, and, on farther trial of dilatation—which should never be omitted—the sensibility of the canal is found to be much diminished. If the passage be of sufficient size, caustic may be applied to the interior of the stricture by means of Lallemand's *porte-caustique*, or, better still, with the instrument devised by Leroy D'Etiolles, which is free from an objection to which the former is liable, viz., that of being forcibly retained by the spasmodic action excited by the application.

The use of potassa fusa in the treatment of urethral stricture was first adopted and recommended by Mr. Whately,[1] who employed a very small quantity, not exceeding one-twelfth of a grain in weight, nor in size "a common pin's head," and only in case a bougie at least a size larger than the finest could be passed into the bladder; that retention, if caused by the treatment, might be relieved by the passage of a catheter. A freer use of potassa fusa in impermeable as well as permeable stricture has since been advocated by Mr. Wade,[2] whose views, founded upon an experience of thirty years, and supported by the details of a large number of successful cases, entitle this agent to a more extended trial than has yet been given it; for, although occasionally mentioned with approval by various writers, and among others by our countryman, Dr. Gross,[3] it has not generally met with much favor, and has been regarded as too powerful and unsafe to be experimented with. Mr. Wade not only believes it as harmless as nitrate of silver, when used with proper caution.

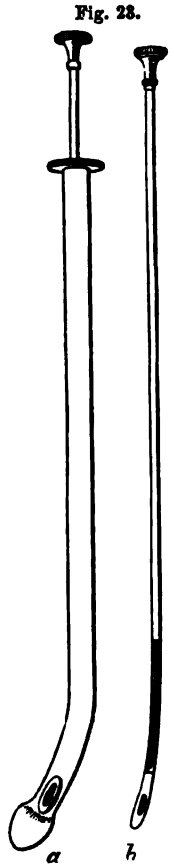
[1] An Improved Method of Treating Strictures in the Urethra. London, 1804.

[2] Stricture of the Urethra, 4th edition, London, 1860, pp. 92–155.

[3] Op. cit., p. 788.

but that it possesses powers far superior; that it is especially indicated in irritable and unyielding strictures, which of late years have been treated by incision; and that it is calculated to supplant urethrotomy altogether, or to confine it to a very few exceptional cases. The following extracts from his work will still farther explain his views, and his mode of practice:—

Fig. 23.



Leroy D'Etiolles' Instrument for "lateral retrograde cauterization." (After THOMPSON.)

"The caustic potash may be advantageously applied to strictures for two purposes: one to allay irritation, the other to destroy the thickened tissue which forms the obstruction. When used in the minute quantity employed by Mr. Whately, I believe its action to be simply that of allaying irritation, as, when mixed with lard and oil, combined with the mucus of the urethra, it can scarcely have any effect beyond a mild solution of caustic, which most probably causes a more healthy state of the lining membrane of the stricture. Before using the potash, a bougie should be passed down to the stricture, that its distance from the orifice of the urethra may be ascertained. A small piece of the caustic, about the size of a common pin's head to commence with, should be inserted into a hole made in the point of a soft bougie. The caustic should be broken just before it is required, and the inner or dark part selected, as the outer portion is usually less efficient, as it is commonly converted into a whitish crust of carbonate of potash. Two notches should be made in the armed bougie, one marking the exact distance of the stricture; the other, an inch beyond; so that its progress, as it enters the obstruction, may be accurately observed. The bougie should be moulded with the finger round the potassa fusa, so that it may be securely fixed; but to insure the action of the caustic, instead of being below the level of the hole, as recommended by Mr. Whately, its points should be fairly exposed to enable it to act upon the stricture.

"The armed bougie should, of course, be well oiled before its introduction; and if the points of the caustic be well covered with lard, there need be no fear of its acting before it reaches the stricture. The bougie should be gently pressed against the stricture for a minute or two if impermeable, and then withdrawn. When the caustic is applied to permeable obstructions, the bougie should be

passed three or four times over the whole surface of the stricture To impermeable strictures, the caustic should be applied with greater caution than to such as are permeable; for should retention of urine occur, it will be more easily relieved in the latter than in the former. It usually happens that, after one or two applications of the caustic, the bougie will be found to enter the obstruction. Before applying potassa fusa to impermeable strictures, every precaution should be taken to guard against irritation. If convenient, the application may be made at bedtime, taking care that the patient passes his urine just before; and should he have been subject to rigors or retention, it will be best to administer an opiate injection an hour previous to the operation.

"It appears to me, that the principal superiority of this caustic to the nitrate of silver, consists in its more powerful solvent effect in removing hard strictures, and that with perfect safety and comparatively with but little pain. Potassa fusa, when used for the destruction of a stricture, instead of causing a solid slough, appears to exert its salutary effects by a process of inflammatory softening and dissolution of the thickened tissue forming the obstruction.

"The periods at which it will be most advisable to repeat the application of the potossa fusa must depend upon its effects, and the nature of the cases in which it is used. In many old chronic strictures, I have used the potash advantageously every second or third day; and in some few instances, under peculiar circumstances, even oftener. When a stricture has been so far removed by the application of potassa fusa as to admit the introduction of a middle-sized bougie, it would be best to discontinue the use of the caustic, unless there should be difficulty in its subsequent dilatation, when an occasional application of the remedy will often be found serviceable."

Incisions.—It is often asserted that when any instrument whatever can be passed through a stricture, dilatation is all-sufficient, and that it is never necessary to resort to cutting instruments; but although this statement is perhaps applicable to the majority of urethral contractions, it is not universally true; for strictures are frequently met with which are so unyielding that dilatation has little if any power over them; or so irritable, that attempts at catheterism can only be made at long intervals; or so resilient, that relapses constantly occur. Cases presenting these characteristics constitute one class of strictures, in which urethrotomy may often be employed

with decided benefit; another class includes certain impassable strictures, and those complicated with false passages.

The question is sometimes asked: "How can incisions effect any permanent good in cases of stricture? None of the adventitious deposit is removed by urethrotomy: the lips of the wound must eventually unite, and the condition of the parts as before the operation be restored: why expect any more benefit than from simple incision of the bands of cicatricial tissue following burns, which are notoriously incurable by such a procedure?" The comparison is a good one, and may serve to show how far the power of urethrotomy extends. It is indeed true that unassisted by other measures, it can ultimately add nothing to the calibre of the passage, and is, therefore, alone incapable of effecting a permanent cure; but, by giving free exit to the urine for the time being, it affords a period of rest; the bladder recovers its tone; congestion and spasm are relieved; the vascularity of the part is decreased, and spontaneous absorption of a portion of the more recent deposit takes place. In this manner, great, though temporary, relief is obtained; but the opportunity is afforded for accomplishing still more. Instrumental dilatation may now be practised under the most favorable circumstances; much of the adventitious material of the stricture may be removed by thus exciting absorption, or, when this is too firmly organized to admit of resolution, the recent fibrinous deposit, which, as in other parts of the body, takes place between the edges of incisions not united by first intention, may be mechanically dilated by the occasional passage of an instrument; the disease is thus kept in abeyance, and comparative comfort afforded.

Incisions may be internal, or from within; external, or from without; in the former, but little more than the substance of the stricture itself is incised; in the latter, the whole thickness of the tissues between the canal and the surface is divided.

INTERNAL DIVISION.—Internal incisions should rarely be practised except for strictures in front of or within the scrotum, or, in other words, in the straight portion of the urethra; when division is required for strictures situated in the sub-pubic curve, external urethrotomy is generally to be preferred as safer and more satisfactory in its results. Non-dilatability, irritability, and resiliency are the chief conditions which require internal incisions, and these are far more frequently met with in strictures of the spongy than any other portion of the urethra. They are most marked in contractions at the meatus, which can very rarely, if ever, be treated suc-

cessfully by dilatation; but they also affect, to a less degree, those which are situated within three or four inches of the external orifice, and sometimes those in the deeper portion of the urethra.

Internal incisions should also be restricted to cases in which the whole thickness of the stricture can be completely divided by a cut of moderate depth; the danger of hemorrhage and of infiltration of pus and urine from deep intra-urethral incisions is too great to admit of the internal division of thick masses of induration, which are more safely treated by external urethrotomy. The distance between the point of the blade when fully projected and the back of the instrument, should rarely exceed four-tenths of an inch, which is the extent of the projection in Civiale's urethrotome, and in that of Dr. Peters and Mr. Thompson it is even less.

Fig. 24.

Civiale's urethrotome.

A great variety of instruments have been proposed for internal incisions, some of which are intended to cut from before backwards by means of a projecting blade, which either has or has not a rod in front of it as a guide; while others are designed to be passed through the stricture and then withdrawn, cutting from behind forwards; they are either straight or curved to correspond with the portion of the canal in which they are intended to be used.

Urethrotomy from before backwards *without a guide* should never be performed except in the spongy portion of the urethra, and then only to prepare the way for the introduction of other instruments. In the deeper portions of the urethra it is highly dangerous, since the direction of the incision cannot be determined with accuracy, important parts may be wounded, or an outlet formed for the escape and extravasation of urine. Internal division from behind forwards should in all cases be preferred, both because it is safer, and because the edges of the cut are smoother and less jagged than when made in the opposite direction.

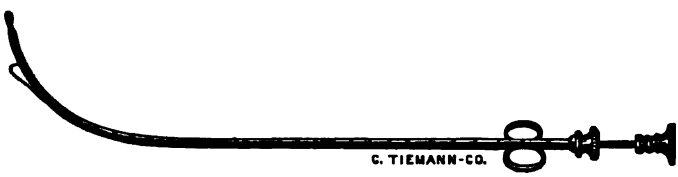
Of the many urethrotomes which have been invented, Civiale's instrument, figured in the adjoining cut, is probably the best, whenever the stricture can be sufficiently dilated to admit of its employment. It is designed to pass through the stricture, and divide it during its withdrawal, after the blade has been made to project. The terminal bulb, in which the blade is concealed, equals in

diameter a No. 5 catheter, and hence the instrument cannot be used when the passage is of less size.

The bulb at the extremity of the instrument will serve to determine the extent of the stricture; and the incision, implicating the floor of the canal, should commence from a quarter to half an inch beyond, and be prolonged to an equal distance in front of it, in order to insure its complete division. After the operation a full-sized catheter should be passed into the bladder (taking care to avoid entangling the point in the wound), and be retained for twenty-four hours, and dilatation should be practised at gradually increasing intervals for a period of several months.

The great objection to Civiale's and some other urethrotomes designed to cut from behind forwards, is that their use presupposes a degree of dilatation which, in most instances, would render their employment unnecessary, and hence that they are not adapted to the very class of cases in which they are most required. This difficulty, however, may be obviated by the preliminary employment of either of two instruments, admirably adapted for the purpose, the one invented by my friend, Dr. Geo. A. Peters, Surgeon of the New York Hospital, and the other by Mr. Henry Thompson of London.

Fig. 25.



The urethrotome of Dr. Geo. A. Peters; the blade projecting.

Dr. Peters's urethrotome consists of a sound supplied with a groove in which a blade slides and within which it is concealed, except when passing over a projection situated about an inch from the extremity. The diameter of the sound does not exceed No. 2½ or 3 of the ordinary catheter scale, and the instrument may therefore be used in strictures of very small calibre. The projection of the blade gives the instrument a diameter equalling No. 6½ or 7.

Mr. Thompson's instrument,[1] the dimensions of which are very nearly the same, is sufficiently explained by the adjoining cut.

In neither of these instruments when used alone, is the depth of

[1] The Value of Internal Incisions in the Treatment of Obstinate Strictures of the Urethra, London Lancet, Am. ed., Jan., 1860. Many practical suggestions contained in this section have been derived from this valuable paper, to which the reader is referred.

Fig. 26.

Fig. 27.

Fig. 26. Mr. Thompson's urethrotome.
Fig. 27. The same with the blade drawn out.

the incision sufficient to divide the whole extent of the adventitious deposit as it more frequently occurs, but they serve to prepare the way for the introduction of a larger urethrotome, as Civiale's, which will complete the operation. My own experience, which has been confined to Dr. Peters's instrument, enables me to recommend it very highly.

Numerous instruments have been invented for the purpose of dividing a stricture from before backwards, of which, as already mentioned, those only should ever be employed, except in the spongy portion of the urethra, which are furnished with a guide to the blade. The simplest and, I think, one of the best is a French urethrotome (Fig. 28), which consists merely of a sound with a

Fig. 28.

projecting elbow, that is blunt except on the margin facing the extremity where it presents a cutting edge. It may thus be passed through a normal urethra without injury to its walls, but will partially cut and partially rupture any obstacle which it meets, the small extremity of the instrument having first been insinuated within the contraction.

The urethrotome of Dr. Westmoreland, Atlanta, Geo. (Fig. 29), consists of a canula, which is to be passed down to the anterior face of the stricture, an exploring wire which is to be passed through it, and a blade which slides upon the latter, and divides the contraction.

Charrière's urethrotome (Fig. 30) is intended for cutting from behind forwards as well as from before backwards; in the latter

case, a fine flexible bougie, which may first be introduced through any permeable structure however tortuous, serves as a guide to the metallic portion of the instrument. Whether so slender a guide as this bougie must often be, will always be followed, is a question which may admit of a doubt, and which no personal experience with the instrument enables me to determine.

Fig. 29.

M. Maisonneuve's urethrotome consists of a Frère Come's cutting instrument, with a filiform bougie attached to serve as a guide as in Charrière's; and highly satisfactory results are reported from its employment.

In using either of the above mentioned instruments, the importance of dividing the whole thickness of the adventitious deposit should not be forgotten. In case the contraction recurs a few days after the withdrawal of the full-sized catheter introduced and retained after the operation, the division has not been complete and the operation should be repeated.

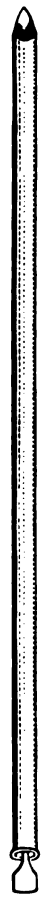
In the rare cases of impassable stricture of the spongy portion of the urethra, internal urethrotomy may be performed by means of the "lancetted catheter," which consists of a canula and a blade projecting from its extremity. It is hardly necessary to observe that while using this instrument, the penis should not be bent upon its point, but that the portions in front of and behind the obstruction should preserve a straight line, in order to avoid wounding the sound urethral walls; and the extremity of the urethrotome should,

if possible, be insinuated within the orifice of the stricture before thrusting forward the blade.

Fig. 30.

Charrière's urethrotome, attached to a conducting bougie, useful when the passage is much contracted, and which may be detached and the point *B* screwed on.

Fig. 31.



Lancetted catheter. (After Gross.)

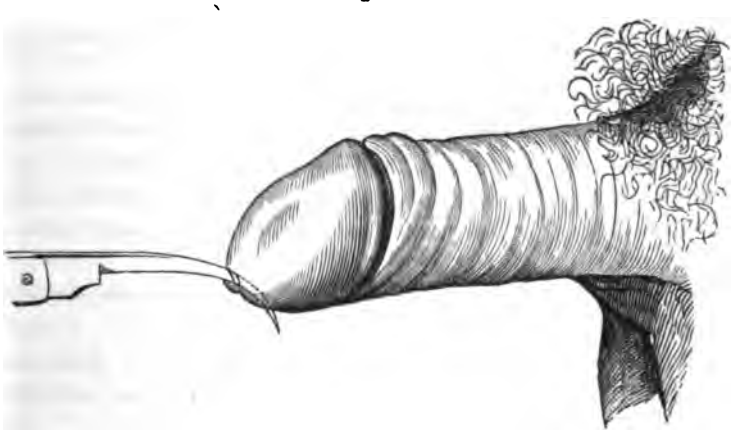
Strictures at or near the meatus are peculiarly undilatable, and can rarely be successfully treated except by incision. When involving the meatus they may be divided by a curved sharp-pointed bistoury; its point protected by wax during its introduction into the canal. (Fig. 32.) When situated a short distance from the external orifice, a probe-pointed tenotomy knife, or Civiale's concealed bistoury (Fig. 33) may be used. After urethrotomy in this portion of the urethra, the edges of the wound exhibit a peculiarly strong tendency to reunion and to reformation of the stricture, and most authors speak of the frequent necessity of repeating the operation. This difficulty, however, may be obviated in a very simple manner proposed by the very able surgeon, Dr. William H. Van Buren, as I can testify from several cases in my own practice. It is merely necessary after the operation to insert a tube like the external portion of a catheter, measuring about two inches in length and sufficiently large to distend the canal, which is to be retained in place by tapes and worn for several days. Besides preventing reunion of the edges of the wound, this little instrument obviates the pain which is otherwise felt in passing water, and its presence is found to occasion but slight inconvenience.

PERINEAL SECTION.

The external division of stricture by an incision through the perineum had, for several centuries, been known as the "bouton-

nière operation," or "perineal section," when, in 1849, Mr. James Syme, of Edinburgh, published a work[1] in which he advocated its employment exclusively in permeable strictures, through which a staff could be passed to serve as a guide, and recommended its adoption in a large—and, in the opinion of the mass of the profession, an unjustifiable—proportion of urethral contractions. Since this time, perineal section upon a guide has been called "Syme's operation," or "perineal division," while the names "boutonnière operation," "perineal section," and "external urethrotomy,' have been restricted to the same operation without a guide. While

Fig. 32.



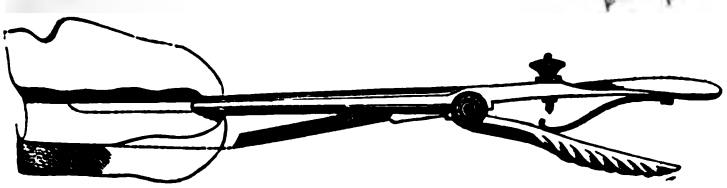


Fig. 33.

(After PHILLIPS.)

acknowledging the credit due to Mr. Syme for having carefully studied the various steps of this operation, and for the introduction of certain improvements in the manner of its performance, it is yet difficult to explain on what grounds this innovation in name has been made; for, should Civiale's statement be called in question, that a staff was employed by Tolet two centuries ago, it is certain that one was frequently used by many operators, both abroad and in this country, long before the appearance of Mr. Syme's essay;

[1] Stricture of the Urethra, Edin., 1849, p. 58.

and, waiving the question of priority, the difference in the two methods is not sufficient to warrant the proposed distinction, which will be ignored in the present volume as it has been by many other writers.[1]

Perineal section was adopted in America in the early part of the present century, and, for the last forty or fifty years, has been the favorite mode of treatment for advanced cases of stricture which could not be benefited by other means.

Dr. H. G. Jameson, Surgeon to the Baltimore Hospital, published a valuable paper on perineal section in the *American Medical Recorder*, for 1824,[2] his first successful operation having been performed Dec. 2, 1820. Dr. Edward Hartshorne, writing in 1855, speaks of perineal section as an "operation which has long been a familiar one in Philadelphia."[3]

But in no place in America has there been a greater, nor, it is believed, so great an opportunity for studying the performance and the results of perineal section as in New York, where this operation, for the last forty or fifty years, may be said to have been identified with the City Hospital and the surgeons connected with this institution.[4]

The principles which should determine the surgeon in deciding upon perineal section, may be stated as follows:—

1. It should not be regarded as applicable to any considerable proportion of the whole number of strictures, but be reserved for exceptional cases, in which milder means have failed.

2. It should not be employed in a low state of the vital powers, nor when extensive disease of the kidneys is present, since, under these circumstances, the danger of a fatal result is materially increased.

3. It is advisable in impassable, unyielding, highly irritable or resilient strictures, which have proved incurable under a thorough and persevering trial of dilatation. The presence of false passages is an additional inducement for its performance, since the abnormal channel may be cured at the same time that the stricture is relieved.

[1] With reference to the history of external urethrotomy, see an interesting article entitled: "Note Historique et Critique sur l'Uréthrotomie Externe ou Section des Rétrécissements de Dehors en Dedans, avant le 18e Siècle," by Dr. Verneuil, in the Archives Générales de Méd., Sept., 1857.

[2] Vol. vii., p. 251.

[3] Review of Thompson on Stricture, Am. Journ. of the Med. Sci., July, 1855.

[4] See two papers by Dr. Lente: Surgical Statistics of New York Hospital, Transactions of the Am. Med. Association, vol, iv., 1851; and Perineal Section for Stricture of the Urethra, New York Journal of Med., March, 1855.

4. It is justifiable in some cases of retention of urine dependent upon stricture, although in most instances puncture of the bladder is to be preferred.

It is highly desirable that the patient should be prepared for the operation by a period of rest, during which he should be confined to the house, and, for the most part, to the horizontal posture, his secretions be regulated, and his system placed in as favorable a condition as possible. The perineum should be shaved, and the rectum evacuated by an enema. The stricture may present three degrees of contraction; it may be entirely impervious to any instrument; it may admit a fine elastic bougie; it may be possible to introduce a grooved sound. In the first case, a catheter of full size is required for insertion in the urethra; in the second, the largest possible bougie should be passed into the bladder, and a metallic tube, open at the extremity, introduced upon it as a guide as far as the obstruction; in the third, the staff employed by Mr. Syme, and which will presently be described, is very serviceable, although a similar combination of a sound and catheter, as in the last case, will answer every purpose.

The patient, having been brought under the influence of an anæsthetic, is placed upon the edge of a table, facing a good light, in the position for lithotomy, with the hands bound to the feet by bandages, and an assistant supporting each knee. The assistant on his left takes charge of the instrument introduced into the urethra, and elevates the scrotum out of the way of the operator; the metallic sound or catheter is to be pressed firmly against the obstruction in such a manner as to render its extremity somewhat prominent. The surgeon, sitting upon a low stool, makes an incision, an inch and a half or two inches in length, exactly in the median line of the perineum, and dividing the tissues by successive strokes of the scalpel, opens the urethra upon the extremity of the instrument in front of the obstruction; and here it is to be observed that it is better to extend the incision upwards a short distance above the extreme point of the catheter, in order to insure the complete division of the stricture in this direction.

The urethra having been opened, the facility of completing the operation will depend very much upon whether a guide has been. or can be, passed through the contraction. When a bougie or staff has been introduced into the bladder at the commencement, the division of the stricture upon it is comparatively easy. If this was found impossible, the next undertaking is to endeavor to pass an instrument through the perineal opening. For this purpose, the

edges of the incision should be held apart by the fingers of assistants, or by means of hooks, or, as proposed by Mr. Avery, a ligature may be passed through the urethral mucous membrane on either side, in order to afford a clearer field of view, and indicate the position of the channel; and the blood should be removed by constant sponging. The most desirable instrument to insert is a grooved director; if this cannot be passed, a fine, flexible bougie, or even a bristle, may be tried. Considerable time, patience, and perseverance are required in this part of the operation, which often occupies from fifteen to thirty minutes, but in most cases, one of the above instruments may eventually be passed. Dr. Gurdon Buck, whose experience in perineal section has been extensive, informs me that he has never met with a case of failure, but I have known other surgeons to be less fortunate If success be attained, the stricture should be divided from below upwards,[1] taking care to include its whole extent, but avoiding making the incision so far backwards as unnecessarily to wound the deep perineal fascia, whereby the danger of extravasation of urine would be increased. Mr. Syme states positively that he has "never found it necessary to cut farther back than the bulbous portion, for the conveyance of a full-sized instrument into the bladder," and that he has never met with a contraction situated posteriorly to this point; but that strictures do exist in the membranous portion, there can be no question, although Mr. Syme's statement is probably nearer the truth than has sometimes been admitted, since the universal tendency has been to assign a seat posterior to the true one, and the oblique direction of the perineal fascia which shortens the inferior aspect of the membranous region is liable to lead into this error. While, therefore, we cannot always expect to avoid opening the deep perineal fascia, it should be guarded against, if possible, and need not frequently occur.

In some cases, as already intimated, it is found impossible to introduce any guide whatever through the obstruction. It then becomes necessary to search for the urethra posterior to the stricture, by carefully dividing the tissues in the median line; if a fluctuating point be felt, it is probably the dilated urethra, and should be opened. It is evident that under these circumstances it must often be impossible to trace the contracted and thread-like passage through the intervening mass of induration; and much time need not be expended in the attempt, if it be not readily

[1] Lest, if made in the opposite direction, the knife, after severing the stricture and ceasing to meet with resistance from the mass of induration, unnecessarily wound the deeper tissues.

found; since the new channel opened by the knife has, in numerous instances, supplied the place of the original canal in a very satisfactory manner.

A free passage having been opened into the bladder, a full-sized catheter should be introduced from the meatus and retained. When a bougie and sliding tube were passed at the commencement of the operation, the latter is readily pushed on to the bladder upon the former as a guide. Otherwise some difficulty may be experienced in introducing the catheter, the point of which is apt to protrude through the perineal opening, and should be guided in the proper direction upon a broad director first inserted through the incision. After the introduction of the catheter, it should be ascertained if it be freely movable in the canal; if it is felt to be "held," some fibres of the stricture probably remain uncut, and should at once be incised; since their complete division is essential to the success of the operation. The catheter is retained by means of a bandage around the waist, to which two perineal straps are attached before and behind, and the rings of the instrument are connected with the latter by threads. The catheter should not be inserted so far that its point will press against the mucous membrane of the bladder. It is better that its external extremity should not be closed, but be connected with a urinal by means of an India-rubber tube, in order that the urine may find free exit and less escape through the wound. The patient should now be put to bed with the thighs elevated and the bedclothes supported by a cradle. Pain may be relieved by suppositories of opium, and one should be introduced within the anus before the patient leaves the table. Subsequent hemorrhage sometimes occurs which it is difficult to arrest by ligature, since the thread does not retain a firm hold upon the gristly tissue of the stricture; it may, however, be effectually controlled by inserting a piece of compressed sponge between the edges of the wound, or firmly plugging it with lint, and bandaging the thighs together.

The catheter may be allowed to remain two or three days, but never more than four, unless in rare instances, when an elastic should be substituted for the metallic instrument, or the former may be employed from the first. This rule is an important one. The danger of prolonged retention lies in the liability to produce ulceration of the mucous membrane and subjacent tissues in consequence of pressure of the instrument. This most frequently occurs at two points: one, that portion of the vesical walls which comes in contact with the extremity of the catheter; the other, the lower surface of the urethra just in advance of the scrotum, at the com-

mencement of the sub-pubic curve, where the penis is upheld by the suspensory ligament, and where any straight instrument, like the shaft of a catheter, necessarily presses upon the inferior wall of the canal. A number of cases illustrating these ill effects have been exhibited at various medical associations of this city within a few years. In one instance death occurred after the catheter had been retained a fortnight, and at the post-mortem examination there was found a small but deep ulceration of the bladder, and another, quite extensive, of the inferior wall of the urethra in front of the scrotum, which was only separated from the surface by the integument. A few years since a man, who had been operated upon by perineal section in California, and in whom a silver catheter had been retained for three weeks, applied to a surgeon of this city for the relief of urinary fistula at the angle between the penis and scrotum, consequent upon this prolonged retention. The injurious effects of such ulceration must be more than local; in subjects so debilitated as patients with stricture often are, they must contribute to the fatal result which sometimes ensues.

The idea sometimes advanced that perineal section is alone sufficient for the cure of stricture, is, with a few very rare exceptions, unquestionably erroneous. Unless catheterism be subsequently practised as after other modes of treatment, a relapse is almost sure to occur. I have been impressed with this fact in conversing upon the operation with different surgeons; having found that those who did not resort to the subsequent passage of instruments were invariably disappointed, while those who did, were as constantly pleased with the results. One gentleman, who has performed it in nine cases, but who has never followed up the treatment with repeated catheterism, tells me that in every instance the disease has returned with its original severity. In this city this principle is well understood; dilatation is usually commenced the day following the withdrawal of the catheter, and is repeated every twenty-four hours, the instrument being left in about half an hour on each occasion. By the time the perineal wound is healed the patient may be taught to pass a catheter upon himself and be dismissed, impressed with the importance of continuing it for a long period. When an entirely new passage for the urine has been opened, or when the stricture was extensive and firm, directions should be given to pass an instrument daily, or every other day, either just before going to bed or early in the morning, and leave it in the urethra half an hour; this is to be continued for at least a month, after which period catheterism is to be repeated at gradually increasing intervals for a

year or more. Unless these directions are faithfully carried out no one need expect the slightest *permanent* benefit from perineal section.

When perineal section is followed by a fatal termination, it is in most cases due to pyæmia; sometimes to urethral fever, attended or not with suppression of urine; and at other times to hospital gangrene, erysipelas, or urinary infiltration. A large proportion of the deaths have occurred in hospitals; in private practice, perineal section is found to be a comparatively safe operation, especially if confined, as it invariably should be, to patients endowed with that amount of vigor which is always requisite when the knife is to be used.

Fig. 34.

In performing "external division," Mr. Syme employs a staff with a slender grooved extremity, which equals in diameter No. 1 or 2 of the catheter scale, and is intended to pass through the stricture; while the main shaft, corresponding in size to No. 8, unites abruptly with the former, and is arrested at the anterior edge of the stricture (Fig. 34). Mr. Thompson uses a similar instrument, but "constructed with a hollow throughout, by which the urine issuing when it arrives at the bladder, the operator knows that the slender point is in its proper place, a satisfactory assurance when false passages exist, and render the right route rather difficult of access."

Mr. Syme gives the following directions respecting the mode of performing the operation: "The patient should be brought to the edge of his bed, and have his limbs supported by two assistants, one of them standing on each side. A grooved director, slightly curved, and small enough to pass readily through the stricture, is next introduced, and confided to one of the assistants. The surgeon, sitting or kneeling on one knee, now makes an incision in the middle line of the perineum or penis, wherever the stricture is seated. It should be about an inch or an inch and a half in length, and extend through the integuments, together with the subjacent textures adjacent to the urethra. The operator then taking the handle of the director in his left, and the knife, which should be a small

straight bistoury, in his right hand, feels, with his forefinger guarding the blade, for the director, and pushes the point into the groove behind, or on the bladder side of the stricture (Fig. 34), runs the

Fig. 35.

(After THOMPSON.)

knife forwards, so as to divide the whole of the thickened texture at the contracted part of the canal, and withdraws the director. Finally a No. 7 or 8 silver catheter is introduced into the bladder, and retained by a suitable arrangement of tapes, with a plug to prevent trouble from discharge of urine.[1] The process having been thus completed, the patient has merely to remain quietly in bed for forty-eight hours, when the catheter should be withdrawn and all restraint removed."

In a clinical lecture, published in the *London Lancet* (Am. ed.), Nov. 1848, Mr. Syme recommends that a catheter through the urethra should be entirely dispensed with after perineal section, and that a short tube through the perineal incision should be substituted for it, the better to protect the edges of the wound from contact with the urine, which appears to be the exciting cause of the rigors, vomiting, rapid pulse, and delirium, which, known as "urethral fever," sometimes follow this operation. The short catheter recom-

[1] Mr. Thompson, expressing, as it would appear, Mr. Syme's latest views, says that the end of the inlying catheter should not be closed.

mended by Mr. Syme, "is about nine inches in length, slightly curved in opposite directions at its extremities, and having a couple of rings just behind the anterior bend for securing it in its place. In addition to the great advantage of affording perfect security, this catheter is much less irksome to the patient than the one hitherto in use, and cannot, like it, produce any bad effect by pressing upon the coats of a contracted bladder."

Mr. Syme boldly takes the ground that this operation, even when not absolutely required by the obstinacy of the case, "is preferable to dilatation, as affording relief more speedily, permanently, and safely." Holding these views, it is not to be wondered at that his operations amount to between one and two hundred, but the freedom with which he resorts to perineal section is justly censured by the almost unanimous voice of the profession. Recently, Mr. Syme has declined to give the exact number of his cases, or the results. He had previously stated that not one of his first seventy operations was fatal, but since then several deaths have been known to occur in his practice. It may readily be conceded that his success, so far as regards mortality, has been unusually great, when it is recollected that he performs the operation in cases of a mild character, which must for the most part be free from renal disease and general depression of the system; but results thus obtained cannot be taken as an indication of the safety of perineal section in advanced cases of stricture. Mr. Thompson gives a list of 219 cases by thirty operators, among which there were fifteen deaths; of these he would exclude two which were not chargeable to the operation, leaving thirteen, or about six per cent. This amount of mortality is sufficient to forbid perineal section whenever milder, though perhaps slower, measures can be successfully employed.

CONSEQUENCES OF OPERATIONS UPON STRICTURE.—Either of the modes of treatment now described may be followed by rigors and other unpleasant symptoms, which in most cases subside without evil result, but which sometimes become serious, and terminate in speedy death. The exciting cause may be simple over-distention of the urethra by a larger bougie than has before been used; abrasion or laceration of its walls by rough handling of the instrument, the application of caustic; or the employment of the knife in internal or external incisions. The patient is suddenly seized with a chill, vomiting, acceleration of the pulse, and in severe cases with great prostration and delirium. These symptoms are most likely to ensue upon the first act of micturition succeeding the introduction

of a sound, or the withdrawal of the catheter after urethrotomy; in other words, they follow, and appear to depend upon contact of the urine with an abraded surface, through which urea or pus finds entrance into the general circulation; in other instances they are apparently due to the shock impressed upon the nervous system alone. This combination of symptoms, which is known as "urethral fever," is but one form of surgical fever, in the etiology of which the absorption of septic matter from the neighborhood of wounds plays so important a part, and which has been so ably and thoroughly described by Professor Simpson, of Edinburgh.[1]

In most cases, urethral fever terminates in resolution, either with or without treatment, in the course of a few hours; but, especially in persons affected with renal disease, and in some instances without apparent cause, a typhoid condition with delirium sets in, abscesses may form in different parts of the body, and speedy death ensue. Complete suppression of the urine is an occasional symptom, and is to be regarded as of very serious import. Mr. Thompson relates "a case of old standing and narrow stricture, in which death was thus caused within fifty-four hours of the passing of an instrument, the same that had been habitually employed on at least a hundred occasions before, no damage whatever having been inflicted by it upon the urethra, as verified by several careful observers on close post-mortem examination of the parts. Rigors and vomiting commenced about an hour after the catheterism, and not another ounce of urine was secreted from that until death. In this case the kidneys were found congested to an extraordinary degree, and their substance was so soft and friable as to give way under gentle pressure."

In a case of perineal section reported by Mr. Syme, "the patient suffered nothing from the operation; had the catheter taken out on the second day; was quite well on the third, and on the fourth was lying dressed upon the sofa in the best of spirits. In the afternoon of that day, during the act of micturition, he felt an acute pain in the perineum, and in walking from one room to another, fell on the passage so as to graze his forehead and the outer side of his knee; at the same time he had a violent rigor, followed by quick pulse and great pain in the injured parts. As the urine passed freely and entirely by the urethra, I expected that these symptoms would soon subside, but they continued and went on to suppuration of the knee, with destruction of the eyeball, and terminated fatally at

[1] Med. Times and Gaz., April 23, 1859.

the end of several weeks. I felt quite unable to account for this case until the following one gave me additional light on the subject: The patient suffered nothing from the operation, which was of the simplest kind, and as he did not complain at all of the catheter, was allowed to retain it three days. When it was then removed, he expressed perfect comfort, and afterwards wrote to his friends at home the most satisfactory account of his progress. At three o'clock of the afternoon he passed urine, and felt some pain in doing so, which was attended by a slight discharge of blood. Immediately afterwards he had a violent rigor, followed by delirium and insensibility. There was no pulse, no secretion of urine, and he died the next day. On examination there was not the slightest trace of urinary extravasation, or any other sign of local mischief; but the kidneys were gorged with blood to an extreme degree; and it was plain that death had resulted from a sudden shock to the nervous system."[1] As already stated, so fatal a result of operations upon the urethra is not frequently met with, but the possibility of its occurrence should always be borne in mind, and lead to the observance of due caution.

In order to conduct the treatment of stricture with safety, the general system should be in as favorable a condition as possible; the digestive organs in good order; and the patient should avoid excess both in diet and exercise. It is important also to abstain from any operative procedure during the persistence of raw and damp weather, or when the patient is fatigued or mentally depressed. Let the bladder be evacuated immediately before the introduction of the catheter, or the use of caustic or the urethrotome, that the succeeding act of micturition may be deferred for several hours, when the abraded surface of the stricture shall be in a measure protected by an effusion of lymph. If rigors occur, they should be met by the external application of heat and rubefacients, as bottles of hot water to the extremities, sinapisms to the spine and abdomen, hot blankets, etc.; and internally by stimulants and opiates. A full dose of the latter should be administered at the outset, and a smaller quantity be repeated every few hours, so as to maintain a steady narcotic action and lull the irritability of the nervous system. The reaction which generally follows should not be treated by active depletion; a tendency to general depression soon supervenes, in which the vital powers must be supported by stimulants and nourishment until nature shall have eliminated the toxical materials which have found entrance into the system.

[1] London Lancet, Am. ed., Nov. 1858.

TREATMENT OF RETENTION OF URINE.

Retention of urine, as already stated in this chapter (p. 274), chiefly occurs either during the acute stage of gonorrhœa, when it is due to inflammation and spasm; or at some period of organic stricture, when, in addition to the causes just mentioned, permanent contraction of the canal plays a more or less important part in its production. It is less frequent in the former case than in the latter, and presents less difficulty in the way of treatment. Remedial measures must vary somewhat with the condition of the patient, and be determined by the judgment of the surgeon.

When dealing with a subject of full habit, or if there be much heat and swelling of the genital organs, or general febrile excitement of a marked character, it is best to commence with the application of cups or leeches to the perineum. The former are preferable, as they abstract blood more rapidly, and about ten ounces of this fluid may be regarded as an average quantity to be drawn. If the latter be employed, they should not be less in number than ten or twelve. Either with or without this preliminary local depletion, according to the circumstances of the case, the patient should be immersed in a hot bath, the temperature of which should be raised to the neighborhood of 102° F., which will probably require the addition of hot water after his entrance, since the bath cannot at first be borne at so great a degree of heat, and is moreover cooled by contact with the body. It is even desirable that a state of syncope should be induced, which will greatly favor the reduction of spasmodic action. In most cases, the patient will pass his urine during immersion; otherwise, before his removal and while still in the water, a medium sized catheter, as, for instance, No. 5, should be well warmed and oiled, and an attempt be made to introduce it; following the rules already laid down, adhering closely to the upper surface of the urethra, stopping for a moment whenever an obstruction is met with, and endeavoring to overcome it by gentle but continuous pressure: by observing these directions, and avoiding the employment of force, no fear need be entertained of doing injury to the inflamed and sensitive mucous membrane. In the rare instances in which these measures do not succeed, the patient should be put to bed, maintained in a state of perfect quietude and rest, and other means of an antiphlogistic and antispasmodic character adopted. A brisk purgative, as croton oil or a full dose of calomel and jalap, may be administered at once,

and be assisted by the following mixture repeated every two or three hours, in order to keep the stomach nauseated and the bowels free:—

℞. Antimonii et potassæ tart. gr. iv.
Magnesiæ sulphatis ℥ij.
Tincturæ opii gtt. xl.
Aquæ camphoræ ℥viij.
M.

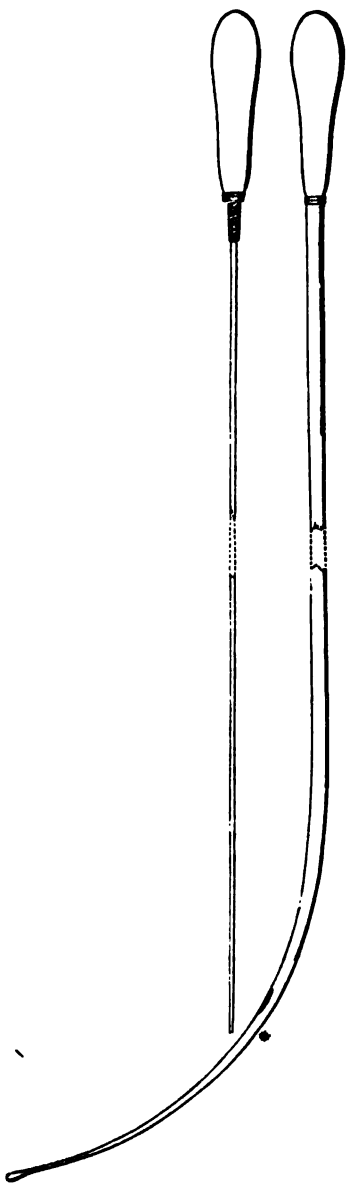
Dose.—A tablespoonful.

Excessive catharsis should, however, be avoided: two or three free evacuations are sufficient; and any tendency to too great action may be controlled by opiate enemata. Indeed, it is always desirable and not inconsistent with the measures just advised, to allay irritability and spasm by keeping the system under the influence of opium, and this can be accomplished in no better way than by rectal injections or suppositories containing laudanum or morphine. If the urine fail to pass in the course of twenty-four hours, an attempt at catheterism may be repeated while the patient is again immersed in a hot bath, or, better still, after the administration of an anæsthetic. It can never be necessary to resort to puncture of the bladder when retention of urine is dependent upon inflammatory stricture. After relief has been obtained, the catheter should be withdrawn, to be reintroduced if found requisite, and a condition of rest should be maintained for several days after the urine has regained its normal freedom.

But retention of urine is most frequently observed as a complication of organic stricture, when its symptoms are generally more alarming and with greater difficulty relieved. The remedial measures required vary somewhat from those above given. Unless the case has already been subjected to instrumental interference, an immediate attempt should be made to introduce a catheter, which will be greatly facilitated by placing the patient under the influence of ether. First, however, if he have not previously been seen by the surgeon, the necessary questions should be asked to learn the history of his case; the degree of contraction of his stricture; what instruments it will admit, or, in default of this, the size of his stream of urine, the duration of the retention, etc. etc. The effect of anæsthetics in relaxing the sphincter of the bladder is frequently observed when these agents are employed for other purposes, as the stains upon the lounge and carpet of a surgeon's office can testify. In retention of urine, the contraction of the muscles in the neighborhood of the bladder and urethra is excessive, being not only stimu

lated by the will, but rendered spasmodic and involuntary by irritation of the afferent nerves; and thus arises one chief obstacle to the natural or artificial evacuation of the bladder, which can be removed far more speedily and effectually by the modern application of ether or chloroform, than by hot baths and opium, which were formerly solely relied on for the purpose.

Fig. 36.



Thompson's "probe-pointed catheter."

The patient having been rendered insensible and his muscles thoroughly relaxed, the situation of the stricture should be ascertained by the introduction of a full-sized instrument; after which gentle and persevering attempts should be made to pass the obstruction with a small metallic or gum-elastic catheter. If not successful with this, a small bougie of gum, whalebone, or catgut may be insinuated within the orifice, and allowed to remain a few moments, when its withdrawal will often be followed by a fine stream of urine; and by repeating the process, if necessary, the entire contents of the bladder may be evacuated. The same result may sometimes be obtained, though with less certainty, by pressure against the anterior face of the stricture. Again, in strictures so contracted that nothing but a filiform instrument will pass, or at least none large enough to admit of being hollow, the ingenious contrivance of "cathétérisme à la suite," as employed by MM. Maisonneuve and Phillips, may be adopted, if the proper instruments be at hand (see p. 298).[1] Mr. Thompson[2] has also in-

[1] An instance of the successful application of this method for the relief of retention, in the hands of Dr. Phillips, is recorded in Championnière's Journal of Practical Medicine and Surgery, for Dec., 1859, p. 552.

[2] Op. cit., p. 181.

vented a catheter "combining tubular construction with minute size," the extremity of which can be made as small as the finest metal probe, and is solid up to about two and a half inches from the point, where the eye is situated; while the hollow shaft above gradually enlarges, first to No. 1, and then nearly to No. 2. A steel rod, capable of being screwed in during the introduction of the instrument, gives it solidity, and prevents the eye from becoming obstructed with mucus or blood.

After the successful introduction of a catheter in cases of retention dependent upon organic stricture, the instrument should be retained in place to obviate subsequent trouble.

Attempts at catheterism may be prolonged to such an extent as to irritate and abrade the canal, even if no violence be used. This should be avoided; and if success be not attained after a reasonable length of time, other measures should be resorted to. Many cases also come under the care of the surgeon, in which instruments have already been used to excess by unskilful hands and in no gentle manner, and in which the urethral walls have been lacerated or false passages opened. Under these circumstances it is best to defer any further instrumental interference for a time. The patient should be immersed in a hot bath to the verge of syncope and removed to bed. and flannels wrung out of laudanum and hot water applied to the genital organs and hypogastrium; but the most reliable remedy at this time is opium, with respect to which Sir Benjamin Brodie says: "From half a drachm to a drachm of laudanum may be given as a clyster in two or three ounces of thin starch. If this should not succeed, give opium by the mouth, and repeat the dose, if necessary, every hour until the patient can make water. *According to my experience, the cases in which the stricture does not become relaxed under the use of opium, if administered freely, are very rare.* The first effect of the opium is to diminish the distress which the patient experiences from the distention of the bladder. Then the impulse to make water becomes less urgent; the paroxysms of straining are less severe and less frequent; and after the patient has been in this state of comparative ease for a short time, he begins to void his urine, at first in small, but afterwards in larger quantities." The testimony of this distinguished surgeon is confirmed by the experience of nearly every practitioner; at the same time it is proper to remark that the effect of this drug should be carefully watched, and that it should not be pushed to excess.

The muriated tincture of iron is also a valuable remedy in cases of retention, and is much employed, especially at the New York

Hospital, where it is given in doses of fifteen to twenty drops every half hour. Some doubt has been thrown upon the action of this agent, from the fact that it is commonly administered in conjunction with opium, to which the credit in successful cases has been ascribed. I have used it alone in several instances with very favorable results, and am disposed to assign it a position second only to opium in the treatment of retention.

In every case of this affection, the perineum should be subjected to a careful examination, since the obstruction may be caused by an abscess or urinary infiltration, the evacuation of which will at once afford relief. When such collections form posterior to the triangular ligament, the external symptoms are often very obscure. If any swelling or doughy hardness can be detected, a free incision should at once be made in the median line with a bistoury. This can do no harm, and is likely to be of essential service. Any collection of feces in the rectum should be avoided, and the bowels, if not open, must be moved by an enema or cathartic. In subjects of a full habit, it may sometimes be advisable to draw blood from the perineum by means of cups or leeches. In the main, however, our reliance must be placed upon the measures previously referred to; and, if the patient be seen at a sufficiently early period, relief may almost always be obtained within twelve or twenty-four hours, either by the catheter, or by rest, the hot bath, opium and tincture of the chloride of iron.

No definite rules can be laid down to determine how long, in cases of retention of urine, it is safe to defer puncture of the bladder. Each case must be decided by itself from a consideration not only of the time retention has lasted, but also of the patient's age, strength, and general condition, the urgency of his symptoms, the danger of rupture of the bladder or urethra, and the risk of injury to his kidneys. Mr. Thompson has the following excellent observations on this point: "There are some surgeons who appear to think as long as a patient, under the influence of complete retention, presents no very urgent constitutional symptoms, it matters little how much his bladder be distended, an almost indefinite amount of endurance being ascribed to that organ. That this is very great, is not to be denied, and the extreme rarity of rupture from this cause, which at length takes place, as we have seen, rather by ulceration than by mechanical extension of its coats, is invariably referred to as evidence in favor of such an opinion. But it is certain that very mischievous consequences may result from extraordinary distention (rupture of the urethra and extravasation of urine being passed over, as suffi-

ciently obvious), in its effects upon the kidney, not merely in the way of temporary interference with the performance of its function as a depurating organ; but in the lasting injury it is conceived that a few hours of extreme pressure and dilatation may exert on its structure. This is so much the more readily susceptible of injury, as compared with the bladder, as the secreting organ exceeds the muscular reservoir, in complexity, delicacy, and intricacy of construction. We may not, therefore, continue safely our baths, opium, purgation, &c., to the extreme limit of endurance on the part of the bladder. Our care for the patient must extend beyond that point, and if from his history or condition we have reason to believe in the existence of organic renal disease, or only to suspect its presence, we shall not be warranted in quietly waiting beyond the time necessary for the exhibition of appropriate medicinal treatment, and the careful use of the catheter, for all of which a very few hours will suffice; supposing, it is of course understood, that his powers of life at first permitted of the pursuance of that course."

But while admitting the importance, and even the necessity of resorting to an operation, when such interests are at stake, it must not be supposed that the cases in which it is required are numerous. It would probably be very near the truth to say, that it is *never* necessary when the patient has from the first been under the care of an intelligent and competent surgeon; and that retention can always be relieved, within a certain period of its commencement, by other and milder measures. Unfortunately assistance is not always sought from those competent to give it, until this period has been passed either in neglect or mismanagement.

It having been decided that an operation is necessary, four methods are at the option of the surgeon: puncture of the bladder by the rectum; opening the urethra through the perineum; puncture above, and puncture through the symphysis pubis. "Forcing the stricture" is sometimes enumerated as a fifth method, but is justly discarded from modern surgery. Puncture of the bladder through the perineum is also obsolete.

PUNCTURE BY THE RECTUM.—This operation is generally admissible, readily performed, comparatively safe, affords the most speedy relief, and is consequently the one most frequently adopted. It is inadmissible in case the prostate is much enlarged from hypertrophy or the presence of a tumor, on account of the danger of wounding this body; also if the bladder be much contracted, since the trocar may perforate its anterior as well as posterior wall. Compared with

opening the urethra in the perineum, it has the disadvantage of not aiming at the relief of the stricture as well as of the retention; but this is in a measure compensated for by the facility with which the obstruction generally yields to dilatation when once an artificial outlet from the bladder has been established, and the urethra is no longer irritated by the passage of urine.

Recto-vesical puncture may be performed with an ordinary curved trocar and canula, about eight inches in length, but it is an advantage to have the former grooved, so as to indicate with certainty by the flow of urine when the point has entered the bladder.

Fig. 37. Fig. 38.

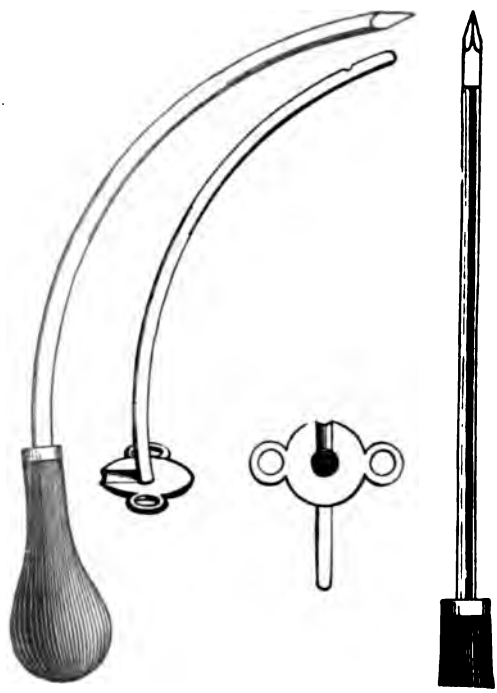


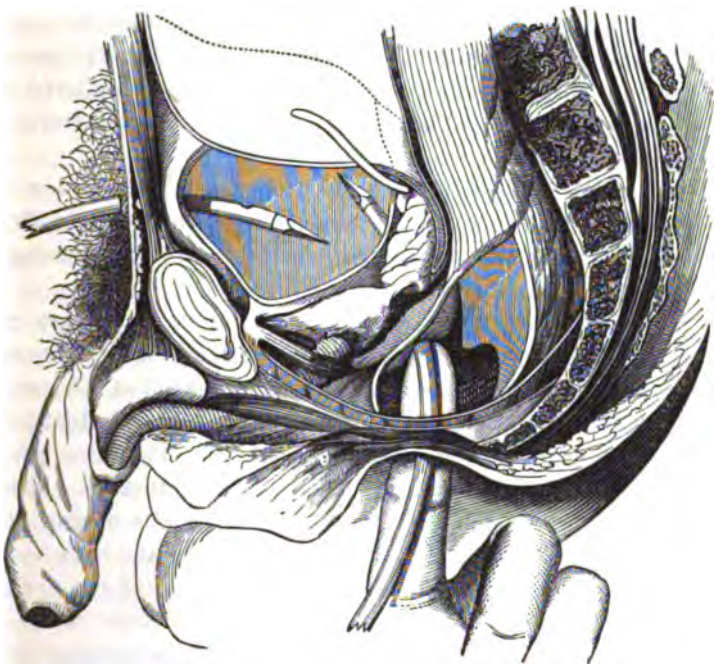
Fig. 37. Side view of canula and trocar. 1. Eye in the former communicating with the groove in the latter. 2. Rings for the purpose of attachment. 3. Channel for the escape of urine.

Fig. 38. Trocar seen on its convex aspect, and showing the groove, which is converted into a tube by insertion in the canula. (After PHILLIPS.)

The patient is to be placed as in the operation for lithotomy, with an assistant supporting each extremity. The lower bowel having been emptied by an enema, the surgeon introduces his left forefinger, well oiled, into the rectum, and feels for the recto-vesical wall just

back of the posterior margin of the prostate. A tap upon the hypogastric region with the opposite hand should communicate a sense of fluctuation to the point of the finger in the rectum, and this is to be regarded as indispensable before proceeding with the operation. The canula and trocar are now to be introduced along the finger as a guide, and, while an assistant compresses with both hands the lower part of the abdomen, the point is directed forwards exactly in the median line, and, by depressing the handle, made to penetrate into the bladder, the accomplishment of which may be known by its freedom in this cavity. The canula, carefully kept in place during the withdrawal of the trocar, is to be fastened by a T bandage, and may be retained until the permeability of the

Fig. 39.



Recto-vesical and supra-pubic puncture. (After PHILLIPS.)

urethra is re-established. The risks of this operation are: wounding the peritoneum or vesiculæ seminales; consequent peritonitis, or inflammation of the appendages and substance of the testicle; persistence of the opening; and abscess between the rectum and bladder. In practice, however, these results rarely follow. The peritoneum is too high up to be much exposed, and the vesiculæ

seminales may be avoided by adhering closely to the median line. The recto-vesical puncture has been known to remain fistulous for life, but generally exhibits a strong tendency to close; and the formation of abscess is rare. This operation has been a favorite one with Mr. Cock, of Guy's Hospital, London, who has performed it in twenty-four instances, and has seen it performed in some four teen others. He speaks of it in very high terms in the *Medico Chirurgical Transactions*, vol. xxxv., where he also gives a plate of a trocar, capable of expansion at its extremity, to avoid its slipping from the bladder.

OPENING THE URETHRA.—An incision into the urethra, which may be made to include the stricture, and thus lay the foundation for subsequent treatment of the latter, is undoubtedly the most advisable operation for the relief of retention, whenever the operator possesses the requisite skill and anatomical knowledge, and provided the perineum be not too deep, nor its tissues too much altered from their normal condition. There are two methods of performing this operation.

In one, which is identical with perineal section already described, considerable difficulty and delay are often encountered in finding the canal back of the obstruction, owing to the thickening and œdema of the perineal tissues.

In the other, the knife is at once directed upon the urethra posterior to the stricture, without any previous attempt at division of the latter, which may afterwards be accomplished or not at the surgeon's option. This method was favorably mentioned by Mr. Liston,[1] and highly recommended by the late Mr. Guthrie.[2] The same preparation of the patient is to be made as for rectal puncture. The left forefinger is then introduced into the rectum, and a narrow, sharp-pointed bistoury, held in the opposite hand, with its back towards the bowel, made to penetrate the superficial tissues of the perineum to the depth of about an inch a little above the verge of the anus, and, cutting upwards in the median line, to form an incision an inch and a half to two inches in length. Fluctuation may often be detected by a finger inserted in the wound thus made, especially if the patient be directed to strain; and, when present, will serve to guide the point of the knife, which should open the urethra back of the obstruction, in the membranous portion, or possibly as far back as the apex of the prostate. Before withdrawing the blade, a director

[1] Practical Surgery, 4th ed., p. 484. [2] Lettsomian Lecture, 1851.

should be passed into the bladder to facilitate the subsequent introduction of a female catheter, which, in case the operation is to rest here, must be fastened in place by a bandage; or a probe may be insinuated through the stricture from behind forwards, to meet a catheter introduced from the meatus, and the obstruction divided upon it; when the subsequent steps will be the same as after perineal section.

PUNCTURE ABOVE THE PUBES.—This operation, which was a favorite with Abernethy, and according to Dr. Wilmot,[1] is practised by Dublin surgeons in preference to recto-vesical puncture, has not been so generally adopted in this country as the preceding methods. It is entirely inadmissible when the bladder is contracted, and difficult of performance when the patient is corpulent; though in spare subjects, with the bladder much distended, its execution is very easy. The chief danger attending it is from infiltration of urine, which should be guarded against by making a free external incision, and by leaving the canula in place for twenty-four or thirty-six hours, and until lymph has been effused around it, before substituting a gum-elastic instrument. Fatal results have sometimes ensued from sloughing of the edges of the wound, and also from perforation of the peritoneum.

In performing this operation, the patient should be placed in a semi-recumbent posture, with the hair shaved from the pubes; an incision is to be made above the symphysis involving the integument and cellular tissue to the extent of about two inches in a vertical direction; the pyramidal muscles may now be separated with the handle of the scalpel, and the bladder felt for by a finger introduced into the wound; the trocar, either straight or slightly curved, with its concavity downwards, should be inclined towards the lower portion of the sacrum, and a gum-elastic catheter substituted for the canula at the end of one or two days.

PUNCTURE THROUGH THE SYMPHYSIS.—This operation has been too infrequently practised to admit of an expression of opinion regarding it. It was first proposed by Dr. Brander,[2] in 1825, and since performed by him; by Dr. Leasure,[3] of New Castle, Pa., and a few others. Its execution is very simple, consisting merely in introducing a trocar, by a rotatory motion, either with or without a

[1] Stricture of the Urethra, 1858.

[2] Séances de l'Athenée de Méd., Paris, 1825; referred to by Thompson.

[3] Am. Journ. of the Med. Sci., April, 1854, p. 403.

previous incision through the integument, between the pubic bones, in the direction of the promontory of the sacrum, and afterwards inserting a piece of flexible catheter through the canula. Should its safety be proved by farther experience, it will possess the advantage, as suggested by Dr. Leasure, of enabling the surgeon, in the absence of other instruments, to relieve retention by means of a simple hydrocele trocar.

TREATMENT OF EXTRAVASATION.

The general principles upon which the treatment of extravasation of urine is to be conducted are: To give free exit by incisions to the escaped fluid and disorganized tissues; to support the vital powers by nourishment and stimulants; to remove and render inert the noxious products of decomposition by cleanliness and antiseptics. At the earliest moment that any external symptoms of extravasation can be detected—nay, before this, if constitutional shock and deep-seated pain lead to the suspicion of the escape of urine, although its presence behind the deep perineal fascia be indicated by no sign appreciable upon the surface—a free incision should be made in the median line of the perineum, where there is but little danger of wounding important vessels. When the extravasation has attained more superficial parts, numerous incisions are required in the scrotum, and wherever else there is distention and a tendency to sloughing or gangrene.

We are generally called upon to sustain the sinking powers of life by the free exhibition of nourishment and stimulants; as beef tea, brandy, milk punch, carbonate of ammonia, quinine, etc. Opium is of value when there is much pain or nervous irritability. Nothing can be done for the relief of the stricture during the continuance of the shock consequent upon rupture, but usually, as this passes off, catheterism may be successfully performed. In case this cannot be accomplished, and if the bladder be found on percussion to be still distended, owing to the small size of the rupture, it is desirable to resort to puncture at once, or to extend the incision in the perineum to the urethra behind the obstruction. The discharge is fetid and ammoniacal from the first, and especially so as the disorganized tissues are cast off by suppuration; hence frequent ablutions, poultices with the addition of Labarraque's solution, or bags of powdered charcoal, and antiseptic lotions are required.

TREATMENT OF URINARY ABSCESS AND FISTULA.

Urinary abscess, as already observed in the present chapter, may arise from ulceration of the urethra and consequent escape of urine,

often in minute quantity, into the cellular tissue, in which case it communicates with the canal from the outset; or it may be produced by simple irritation of the neighboring parts, and, although isolated at first, eventually open into the urethra. In both cases the sooner the abscess is evacuated by external incision, the better; in the former, in order to quiet the constitutional disturbance which ordinarily ensues, and prevent the extension and burrowing of matter; in the latter, to effect the same purpose, and also to avoid, if possible, any lesion to the urethral walls and the formation of urinary fistula; for when once the urine has found an abnormal outlet, it acts as a constant irritant, and renders difficult the closure of the passage either by nature or by art. When matter is pent up behind the triangular ligament, it is often exceedingly difficult to detect its presence by external examination; there is usually, however, even in obscure cases, some degree of hardness and tenderness on pressure, and if its existence is rendered probable by the general symptoms, as a chill, nausea, rapid pulse, etc., an incision should at once be made in the median line of the perineum in front of the anus; even if pus be not at first found, a passage will be formed for its subsequent exit, and the tension of the parts will be relieved. In some exceptional cases, urinary abscess assumes a chronic character, and is attended by little febrile excitement or inconvenience; thus, a small tumor, formed by an abscess communicating with the urethra, sometimes exists for months before being discovered by the patient or surgeon, unless a careful examination of the perineum be made.

Urinary fistulæ, in most cases, contract and close spontaneously when the stricture has been thoroughly dilated, especially if the general condition of the patient be maintained at a proper standard of health. Assistance may be derived from stimulating applications to the sinus; as of nitrate of silver, nitric acid, tincture of cantharides or iodine, etc. The end of a probe may be coated with nitrate of silver and passed along the fistulous track; one of the tinctures just mentioned, either pure or diluted with water, may be injected; and plugs of compressed sponge may occasionally be inserted to advantage. Fistulæ in front of the scrotum frequently require plastic operations, a description of which may be found in works on general surgery.

PART II.

THE CHANCROID AND ITS COMPLICATIONS.

CHAPTER I.

THE CHANCROID.

I ADOPT the name of "chancroid" to designate the "contagious and local ulcer of the genitals," the history of which has been given in the introduction of the present work.

This ulcer arises only in consequence of contagion from its like, and secretes a fluid capable of reproducing itself when implanted beneath the epidermis or epithelium of any portion of the skin or mucous membranes. Its secretion may be taken up by the lymphatics and conveyed to the nearest ganglion, there to set up inflammation and the formation of matter possessing the same power of reproduction as the secretion of the sore itself; but its farther progress is arrested within the ganglion; it never gains access to, or contaminates the general circulation; and, since its influence is thus confined to the neighborhood of the point of implantation of the virus, the ulcer is said to be local.

This sore is the "simple," "soft," "non-infecting," or "non-indurated chancre" of various authors; the "chancrelle" of Diday; and the "chancre" of Hebra, Zeissl, Reder, and others of the modern German school.[1]

FREQUENCY.—Chancroids constitute by far the larger proportion of venereal ulcers resulting directly from contagion. Of 341 such sores observed at the Hôpital du Midi in the course of three months, 215 were chancroids. M. Puche has prepared a table of all venereal ulcers under treatment at the same hospital during ten years (1840–1850), forming a total of 10,000, of which 8045 were chancroids and

[1] See Introduction, p. 52.

1955 were chancres;[1] in other words, the ratio of the former to the latter was nearly as 4 to 1. The statistics of other observers vary somewhat from the above, but they all concur in showing the much greater frequency of the chancroid. Ricord explains this difference on two grounds: first, that the chancroid furnishes a more copious secretion, and generally for a longer period, than the chancre; and, secondly, that an attack of the former, unlike one of syphilis, affords no protection against subsequent contagion.

SEAT.—The chancroid is most frequently seated in the neighborhood of the genital organs, simply because these parts are most exposed to contagion and not in consequence of any peculiar aptitude which they possess. If the chancroidal virus be inserted beneath the epidermis of any other part of the body a chancroid is equally the result. Nor is this the limit to its seat: it is also found within various mucous canals — as the urethra, vagina, and rectum — opening upon the surface, at as great a depth as these passages can be explored by the senses during life; and post-mortem examinations have proved the possibility of its presence in the bladder, though such instances are extremely rare. The whole external integument, and whatever portions of the mucous membranes are accessible to the implantation of the virus, are therefore exposed to become its seat. The frequency with which it is met elsewhere than upon the genitals, depends in a great measure upon the habits and cleanliness of persons exposed to contagion.

The following table exhibits the seat of 343 chancroids, comprising all that were observed at the Hôpital du Midi, in the year 1856.[2]

On the glans and prepuce	296
On the skin of the penis	15
On various parts of the penis	17
Involving the meatus	9
Within the urethra (not visible on forced separation of the lips of the meatus, but recognized by inoculation, palpation, inflammation of the lymphatics, etc.)	3
On the anus	2
On the fingers	1

A singular exception to the rule that all portions of the body are equally prone to contract a chancroid has been noticed, viz., that this ulcer is rarely, if ever, met with in practice upon the head or face, where, on the contrary, the initial lesion of syphilis is not

[1] FOURNIER, Leçons sur le Chancre, p. 15.
[2] FOURNIER, Leçons sur le Chancre, p. 252.

uncommon. At one time this fact excited no little discussion, since it was supposed to conflict with the distinct nature of the chancroid and syphilis, and to favor the idea that the seat of the contagion exerted an influence either for or against contamination of the general system, and hence that the chancroidal and syphilitic poisons were one.

The important bearing of this question led to an extensive investigation for the purpose of ascertaining if the alleged exemption was founded on fact. Fournier[1] took a prominent part in this labor, and, from a diligent search through medical works and inquiry of those who made a special study of venereal, was able to collect 150 cases of venereal ulcers upon the head and face, all of which, however, with the exception of 5, were chancres. These five exceptional cases, in which the ulcer was supposed to be a chancroid, had been observed by MM. Ricord, Venot, Devergie, Bassereau, and Diday; but Ricord confessed that his case, an ulceration at the base of one of the superior incisor teeth (figured in his *Iconographie*, pl. 21), was unreliable, and the other four were all imperfectly reported; and thus there could remain no doubt of the rarity, if not of the entire absence, of the chancroid upon the region in question.

Among the various theories offered in explanation, the one advanced by MM. Diday and Fournier was perhaps the most probable, viz., that the absence of the chancroid upon the head and face is due to local idiosyncrasy, similar to that which leads many other diseases to select certain regions, and avoid others of the same anatomical structure. Thus, gonorrhœa, croup, and rheumatism, attack respectively the eye, larynx, and pericardium, and spare the nose, œsophagus, and peritoneum; and scabies is never met with upon the face. Fournier was also able in several instances to trace out the origin of chancres upon the head and face, and found that there was never an interchange of the two species, but that they invariably arose from syphilitic contagion; hence, admitting the absence of the chancroid upon this region in clinical experience, it constitutes no argument against a double virus.

It has been since ascertained that the chancroid can be developed upon the head and face by artificial inoculation. Puche[2] and Rollet[3] have inoculated its virus with success upon different parts of the

[1] Étude sur le Chancre Céphalique, Union Médicale, Feb. and March, 1858.

[2] Nadau des Islets, De l'Inoculation du Chancre mou à la Région Céphalique, Thèse de Paris, 1858.

[3] Gaz. Méd de Lyon, Dec., 1857.

head in 20 instances; Bassereau[1] and Prof. Huebbenet,[2] of Kieff, upon the lips and cheeks in five; Robert[3] upon the temple, nose, and lips in three, and in all the sore so produced was entirely free from induration, and was not followed by secondary symptoms—a fact which utterly demolishes the argument of the "unicists."[4] At the same time it must be admitted that the extreme rarity of the chancroid upon the head and face is not as yet fully explained. The ease with which the above-mentioned inoculations took effect does not favor the idea of local inaptitude, as supposed by MM. Fournier and Diday. The preponderance of primary syphilis over the chancroid may readily be accounted for, as suggested by Rollet, on the ground that syphilis is often transmitted by secondary lesions which are very common in the buccal cavity, and that contact is no less frequent and intimate between mouth and mouth than between the genital organs of the two sexes; but we are still at a loss to explain the almost entire absence of the chancroid in clinical experience upon the region referred to.

I shall content myself with this brief sketch of the discussion relative to the "cephalic chancre," which for a time attracted no little attention, but which assumes less importance now that it is known not to conflict with a duality of poisons. Its only practical bearing is this: that the rarity, if not the entire absence of the chancroid upon the head and face, furnishes strong ground of belief that any venereal ulcer met with upon this region is syphilitic.

CONTAGION.—The vehicle of the chancroidal virus is the secretion of the ulcer, and, more definitely, the contained pus-globules; for, according to Rollet's experiments, if the chancroidal secretion be freed from pus-globules by filtration, the remaining fluid is innocuous.

When kept from contact with the air at a moderate temperature, the chancroidal virus preserves its power of contagion for a considerable length of time. Ricord states that he has inoculated it with success after preserving it in glass tubes hermetically sealed for

[1] BUZENET, Du Chancre de la Bouche, Thèse de Paris, 1858, p. 41.

[2] L'Union Médicale, May 20, 1858.

[3] Nouveau Traité des Mal. Vénériennes, Paris, 1861, p. 380.

[4] Robert's reply to this, that a chancroid may be forced upon the tissues of the head and face by artificial inoculation, but that the same tissues will develope a syphilitic ulcer even from the chancroidal virus, when contaminated *in coitu*, appears to me weak and puerile. What possible difference upon the development of the sore can it make, whether the virus is deposited by the surgeon's lancet or by the penis in connection *ab ore?*

seventeen days. Sperino relates a remarkable instance of its preservation. A lancet which had been employed in artificial inoculation had been laid aside for seven months, when it was observed that a small quantity of dried pus had been left upon its point. The instrument was moistened, and three punctures made with it gave rise to as many chancroids. If exposed to a high degree of temperature, or if mixed with alcohol, an acid, or alkali, the chancroidal virus becomes innocuous. If frozen and then thawed, it may still be inoculated. Dilution with from six to ten times its quantity of water does not destroy its potency; but it is said that if two inoculations be made, one with diluted and the other with pure matter, the ulcer produced by the former will be smaller, although just as persistent as the one from the latter.[1] Mixture with vaccine, gonorrhœal, or syphilitic matter does not impair its power; it may thus be transmitted in the procees of vaccination, and its communication in common with the syphilitic virus gives rise to the so-called "mixed chancre."

Simple contact of the chancroidal virus with a raw surface is sufficient to give rise to a chancroid. The most favorable condition for contagion to take place is the presence of abrasions or other solutions of continuity, such as are frequently occasioned by violence during coitus, and through which the poison may penetrate beneath the epidermis or epithelium. The application of virulent matter to the sound external integument hardened by exposure and friction, is as innocuous as the deposit of vaccine virus upon the skin without previous puncture. The surgeon frequently soils his fingers with the secretion of chancroids, and this with impunity so long as their surface is intact, but the slightest abrasion is liable to be inoculated.

Cullerier's experiments relative to mediate contagion establish the fact that virulent pus may be retained for some time in contact with even a delicate mucous membrane, as the walls of the vagina, without effect. As a general rule, however, mucous surfaces offer a much less effectual barrier to contagion than the external integument, and are, therefore, most frequently the seat of chancroids. Even when no solution of continuity has prepared the way, the virus deposited upon the surface, in some fold of the membrane or in an open follicle, may act as an irritant, produce a superficial erosion, and thus gain entrance beneath the surface. The greater or less time occupied by this process will account in a measure for the variable period after exposure at which the chancroid appears.

[1] Reder, Pathologie und Therapie der Venerischen Krankheiten, Wien, 1863, p. 142

The so-called practice of syphilization affords ground of belief that the susceptibility of the skin to the development of chancroids generally diminishes under repeated inoculations, until finally temporary immunity is obtained. This is not always the case, however, for Lindmann, a German medical student at Paris, succeeded in inoculating himself 2500 times with the chancroidal virus. When repeated inoculation with the same virus at last fails, virus from a fresh source will often succeed.

The transfer of matter necessary to contagion most frequently takes place in a direct manner during coitus. Since the chancroid rarely, if ever, occurs upon the mouth or face, instances of "mediate contagion" through the intervention of some article in common use, as a towel, drinking vessel, pipe, etc., are much rarer than with the syphilitic virus. There is reason to believe, however, that in rare instances virulent pus may be transported from one person to another by the genital organs of a third, which merely serve as a vehicle, and are not themselves inoculated. For instance, a man may be the medium of contagion between a woman of the town and his own wife, while he himself escapes; or, with greater probability, a woman may be the bearer of contagion between two men. To test the possibility of such an occurrence, M. Cullerier instituted the following experiment:—

Louise Vaudet entered the Lourcine Hospital Oct. 10, 1848, to be treated for an ulcer of a grayish aspect and with sharply cut edges in each groin, which had already persisted without treatment for a month. There was considerable surrounding inflammation, which was subdued by rest and poultices, when the genital organs and anus were carefully examined and found to be free from ulceration. The vagina was reddened and smeared with an abundant muco-purulent secretion, but its mucous surface was intact and the os uteri healthy. The inguinal ulcers were dressed with charpie moistened in aromatic wine, and vaginal injections of a solution of alum ordered; under which treatment the sores and vaginitis rapidly improved.

Nov. 25, after finding on a second examination that the mucous membrane of the vulva and vagina was, as before, intact, and after inoculating without success the vaginal secretion, M. Cullerier collected upon a spatula a considerable quantity of pus from the ulcers in the groins and deposited it in the vagina. The patient was then directed to walk about under surveillance lest she should touch the parts, and at the end of thirty-five minutes was again placed upon the bed, and some of the fluid found in the vagina was inoculated upon her thigh. The vagina and vulva were then freely washed with water, dried, and washed a second time with a solution of alum. Two

days after, the inoculation had produced the characteristic pustule of a chancroid, which was left another twenty-four hours to confirm the diagnosis and then destroyed with Vienna paste. Repeated subsequent examination showed that no ulceration had been caused in the vagina, which was not even more inflamed than before. In two months the patient left the hospital cured of both her vaginitis and inguinal ulcers.

In a second case in which this experiment was performed, the pus was allowed to remain in the vagina for nearly an hour and did not take effect.[1]

INOCULATION.—Since artificial inoculation is the best, and indeed the only sure test of the presence of the chancroidal virus, the steps of the process and the ensuing phenomena require special description.

In performing artificial inoculation, some convenient part of the integument of the person bearing the ulcer, as the arm, thigh, or abdomen, is selected, and a superficial puncture made beneath the epidermis, as in inoculating the vaccine virus. The lancet employed should be new, or freshly ground, and little, if any, blood should be drawn, lest it wash away the virus, and invalidate the experiment; if more appear than is barely sufficient to redden the part, a fresh puncture should be made. Some of the secretion which it is desired to test should now be inserted in the wound, and the inoculated point covered with a watch-glass to protect it from abrasion. The glass is retained in place by strips of adhesive plaster arranged around its margin, and leaving the centre free through which the effect may be observed. If the inoculation be successful, the point of puncture becomes red in the course of a few hours; by the second or third day, it has swollen, and forms a small papule, surrounded by a reddish areola; on the third or fourth day, the epidermis is raised by an effusion of serum which soon becomes turbid from an admixture of pus; by the fifth day the fluid is decidedly purulent, and forms a pustule, the summit of which is often umbilicated like the pustule of variola; meanwhile, the surrounding areola has been increasing in width and depth of color, and has now attained its height. The pustule thus formed is often termed the "characteristic pustule" of a successful inoculation, and is identical in appearance with the pustule of ecthyma; if any doubt remain as to its nature, its secretion may be tested by a second inoculation. If the pustule be left unbroken, the contained matter concretes, and forms a scab of conical

[1] Quelques Points de la Contagion médiate. Mémoires de la Soc. de Chir., quoted in Leçons sur le Chancre, p. 255.

form, which increases by additions to its circumference. If this scab be removed, an ulcer is found beneath it, which may be regarded as the type of a chancroid. Its peculiarities are, that it penetrates the whole thickness of the skin or mucous membrane, so that its floor is formed by the subjacent cellular tissues; its edges are abrupt, jagged, and often slightly undermined; its outline is circular; its surface is of a grayish color and uneven, presenting slight elevations and depressions which are best seen through a magnifying glass. The tendency of this ulcer is to extend, or, at least, not to diminish, for weeks; and in this it again differs from the pustule and more superficial ulceration, which may be induced by the inoculation of simple but irritant matter.

Such is the evolution of a chancroid after artificial inoculation, as observed by Ricord and others, in many thousand instances.

At the time Ricord performed his experiments the distinct nature of the chancroid and syphilis was unknown, and supposing he was inoculating the syphilitic virus, he was led to infer, that successful auto-inoculation was a test of the initial lesion of syphilis; that a chancre was destitute of a period of incubation, and that it frequently commenced as a pustule—conclusions which are now known to be applicable only to the chancroid.

It would be improper to leave this subject without uttering a few words of caution to those who would practise artificial inoculation as a means of diagnosis. If the inoculation prove successful the resulting pustule should be laid open at the earliest moment after its character has been determined, its cavity be carefully cleansed. and the ulcer thoroughly destroyed by the application of nitrate of silver, Vienna paste, or nitric acid. If destructive cauterization be delayed for even twenty-four hours, the neighboring tissues may become so infiltrated with the virus that the most thorough application will fail to include them all, and a most troublesome and persistent ulcer be the result. I have myself seen two such cases; one in the New York Hospital, in which artificial inoculation, performed before the patient's entrance, had given rise to an extensive ulcer upon the thigh of several years' duration; and another in the Pennsylvania Hospital, Philadelphia. Other cases are reported in works on venereal. With due caution, however, this accident may be avoided, and artificial inoculation be employed with safety for the purposes to which it is applicable.

Symptoms.—The phenomena following artificial inoculation as above described, exhibit the mode of evolution of the chancroid, and

the various forms it may assume. It is not preceded by a period of incubation. The ulcerative process commences immediately upon implantation of the virus, and is sufficiently advanced to attract the notice of the patient in from one to eight days after contagion. The late period at which it is observed in a few instances is to be ascribed to the contagious matter having remained for some time upon the surface before penetrating beneath the epidermis or epithelium, or else to the sore having been overlooked.

When the part inoculated is the internal surface of a follicle or fissure, the mouth or edges of which close over the imprisoned virus, the resulting chancroid first appears as a pustule or small abscess, which remains intact for a longer or shorter period, according as it is protected, or not, from abrasion. The pustular form is, however, not common, except as the result of artificial inoculation—or, rather, the pustule is usually ruptured before the patient comes under observation, and only the ulcer beneath it remains. When contagious matter has inoculated a previous solution of continuity, the chancroid is from the outset an open sore, at first corresponding in shape and size to the fissure, rent, or abrasion, in which it is developed, and gradually assuming the more marked characters of a specific ulcer.

The chancroid, when fully formed, presents the following symptoms: its outline is circular, unless modified by the shape of the solution of continuity in which it is implanted; by a difference in the density of the tissues beneath it, as when seated upon the margin of the glans penis and prepuce, when it extends most rapidly in whatever direction the tissues are most lax; or, by the union of several adjacent chancroids, when the resultant ulcer may be very irregular. Chancroids upon the free margin of the prepuce appear like slits or fissures while the glans is covered, but when the latter is exposed, are found to be nearly circular.

The rapid perforation of the skin or mucous surface by the chancroid, appearing as if a portion of the membrane had been punched out, is highly characteristic of this species. The edges are jagged, abrupt, and sharply cut, and do not adhere closely to the subjacent tissues. The floor of the ulcer is uneven, studded with minute elevations, "worm-eaten," and covered with a pseudo-membranous secretion of a grayish-yellow color, which cannot be removed without violence. The fluid secretion is copious and purulent; under the microscope it is found to consist of pus-globules mixed with organic detritus.

The chancroid is surrounded by an areola which varies in width

and depth of color with the degree of attendant inflammation. The condition of the tissues around and beneath it is one of the most important elements of diagnosis between this and a true chancre. In the form we are now considering, the parts always preserve their normal softness and suppleness, unless subjected to some irritant, or attacked by simple inflammation. Inflammatory engorgement, however, is not well defined like the specific induration of the initial lesion of syphilis, but gradually subsides into the normal suppleness of the neighboring tissues, to which it is adherent; it is also less firm, and of a more doughy feel, and disappears shortly after the cessation of the inflammation which occasioned it. The application of any astringent lotion, or caustic, as nitrate of silver, potassa fusa, nitric acid, etc., may cause hardness which so closely resembles specific induration, that it cannot be distinguished from it, except by its shorter duration; and, for the time being, the diagnosis must be founded upon other symptoms. Still another source of error is the possibility of a chancroid being situated upon the persistent induration of a previous chancre.

Chancroids are more frequently multiple than single. Of 254 patients in the Hôpital du Midi, 48 bore one, and 206 several; and of the latter, 116 had from three to six; 41 from six to ten; 8 from ten to fifteen; 4 from fifteen to twenty; and 5 over twenty.[1] Of 118 patients in the Antiquaille Hospital at Lyons, affected with chancroids, 50 presented one, and 68 several.[2] When but one chancroid appears at the outset as the immediate result of contagion, others are apt to spring up around it from successive inoculation, since the original ulcer pours out an abundant secretion, and its presence confers no immunity against others.

The chancroid is very persistent. Unless it can be destroyed by a strong caustic or otherwise, it will generally last for weeks and may last for months, however skilfully treated either by local or constitutional remedies. Fournier has shown that it may be inoculated upon the person bearing it up to the time when cicatrization is nearly complete: as Ricord expresses it, the specific period of the chancroid absorbs nearly the whole of its existence. Unless complicated with phagedena, however, this ulcer is self-limited, and will in time heal spontaneously, without other treatment than attention to cleanliness. The average duration of the destructive period may be estimated at about four weeks, during which a portion of the neighboring tissues are destroyed and the edges of the sore are undermined.

[1] Fournier, op. cit., p. 41.

[2] Debauge, Traitement des Chancres Simples, etc., Thèse de Paris, 1858, p. 6.

During the fifth week the progression of the ulcer ceases; the surrounding hyperæmia, œdema, and redness disappear; granulations spring up, commencing at the periphery; and cicatrization goes on towards the centre. During either the progressive or reparative stage, the application of fresh water will produce a new contagion which will run the same course as the original ulcer.

In the majority of cases of the chancroid, the neighboring lymphatic ganglia remain intact throughout the whole course of the disease. In the remaining minority, these bodies take on inflammatory action, either *firstly*—as the result of sympathy with, or the extension of simple inflammation from, the local ulcer, or *secondly*—in consequence of the absorption and conveyance to the ganglion of the chancroidal virus. In the former case (inflammatory or sympathetic bubo), resolution is possible without suppuration; in the latter (virulent bubo), suppuration is inevitable. Of 267 cases of chancroid observed at the Hôpital du Midi in one year, 65 were attended with bubo, and 142 were not.[1] Of 140 patients in the service of M. Rollet, at Lyons, 52 were free from inguinal reaction, while 83 had buboes of which 60 were virulent.[2] We shall see hereafter that the initial lesion of syphilis is always attended with *induration* of the nearest lymphatic ganglia, which rarely become inflamed and suppurate. Hence an examination of the condition of the ganglia in the neighborhood of a venereal ulcer affords assistance of the highest value in distinguishing a chancroid from primary syphilis.

DIAGNOSIS.—The chancroid is apt to be confounded with a simple abrasion, with herpes, and with the initial lesion of syphilis.

An abrasion due to violence during coitus will be recognized by the patient himself—unless intoxicated—either at the time of its occurrence, or during those reflective moments which follow the exposure, when, as Aristotle sententiously remarks: "omne animal post coitum triste." Independently of its history, an abrasion may often be recognized by the jagged outline of its edges and by the appearance of its surface and its secretion, differing, as they do, from those of a chancroid already described. Subsequent neglect, a low condition of the general system, the accumulation of filth or even of the natural secretion of the part, may perpetuate the solution of continuity thus made, and transform it into an ulcer which can with difficulty be distinguished from a chancroid; and the diagnosis can only be made either by artificial inoculation or by waiting for farther

[1] FOURNIER, op. cit., p. 34.

[2] DEBAUGE, op. cit., p. 72.

developments, at the same time paying attention to cleanliness and to general hygiene. "But," it may be said, "an abrasion occurring at the time of coitus may have served as the door of entrance either to the chancroidal or syphilitic poisons." Very true; and consequently when a patient seeks advice, a day or two after coitus, with a solution of continuity evidently due to violence, the surgeon can only estimate its present but not its future character. Under such circumstances, a guarded opinion only should be given, as, for instance, "You have torn yourself in the sexual act; but whether you have been inoculated or not through the rent, I cannot say; time will determine." A mere abrasion or tear, in a healthy constitution and under conditions of cleanliness, will heal in the course of a few days; while an abrasion inoculated with the chancroidal virus will extend and assume the character of a chancroid.

An eruption of herpes usually appears on the first or second day after exposure, and consists of a number of small vesicles which are arranged in one or more groups affecting the form of a circle. The contained fluid soon becomes turbid, and if the epidermis be ruptured or removed, a superficial ulceration is found beneath. With attention to cleanliness and the interposition of a piece of dry lint between the glans and prepuce, the vesicles or erosions will usually heal in the course of a few days. Their circular arrangement, small size, watery fluid, superficial character, and speedy cicatrization, present a marked contrast to the symptoms of the chancroid; and artificial inoculation may be resorted to in the few cases in which a doubt is possible. Many men, especially those with a long prepuce, are subject to attacks of herpes after intercourse with any woman however pure, and the patient's previous history in this respect should therefore be inquired into.

A recital of the diagnostic symptoms between the chancroid and the initial lesion of syphilis would be but to rehearse the symptoms of these two lesions given at length in this and a subsequent chapter. They can best be contrasted in the synoptic table at the close of the present section.

In determining the nature of a suspected sore, no opportunity should be neglected of examining the person from whom the disease was derived. Since there is never an interchange between the chancroid and syphilis, the symptoms presented by the giver of the ulcer will throw light upon the nature of the disease in the recipient. The absence of induration, the presence of a suppurating bubo, or, provided no general treatment has been administered, the non-appearance of general symptoms within three months after con-

tagion in the former, will indicate that the latter has a chancroid. On the contrary, if a person with an indurated ulcer or with general syphilis, communicate a sore to another, the latter, without doubt, has a chancre. This method of arriving at a diagnosis is of special value in married life. In several instances, when informed by husbands affected with syphilis that they had communicated their disease to their wives, I have been able to treat the latter by means of specific remedies without making an examination, and have thus avoided a disclosure which could accomplish no possible good, and would surely have been productive of much misery.

DIAGNOSTIC CHARACTERS OF THE CHANCROID AND CHANCRE.

THE CHANCROID.	THE CHANCRE.
Origin.	*Origin.*
Always derived from a chancroid, or virulent bubo.	Always derived from a chancre or syphilitic lesion.
Has no period of incubation.	Has a period of incubation.
Anatomical characters.	*Anatomical characters.*
Generally multiple, either from the first or by successive inoculation.	Generally single; multiple, if at all, from the first; rarely, if ever, by successive inoculation.
An excavated ulcer, perforating the whole thickness of the skin or mucous membrane.	Frequently a superficial erosion; not involving the whole thickness of the skin or mucous membrane, of a red color and nearly on a level with the surrounding surface. Sometimes an ulcer, when its
Edges abrupt and well-defined, as if cut with a punch, not adhering closely to subjacent tissues.	Edges are sloping, hard, often elevated, and adhere closely to subjacent tissues.
Surface flat but uneven, "worm eaten," wholly covered with grayish secretion.	Surface hollowed or scooped out, smooth, sometimes grayish at centre.
No induration of base unless caused by caustic or other irritant, or by simple inflammation; in which case the engorgement is not circumscribed, shades off into surrounding tissues, and is of temporary duration.	Induration firm, cartilaginous, circumscribed, movable upon tissues beneath. Sometimes resembles a layer of parchment lining the sore. Generally persistent for a long period.
Pathological tendencies.	*Pathological tendencies.*
Secretion copious and purulent, auto-inoculable.	Secretion scanty, chiefly serous; inoculable with great difficulty, if at all, upon the patient or upon any person under the syphilitic diathesis.
Slow in healing. Often spreads and takes on phagedenic action.	Less indolent than the chancroid. Phagedena rarely supervenes and is generally limited.
May affect the same person an indefinite number of times.	One attack affords complete or partial protection against a second.
Characteristic gland affection.	*Characteristic gland affection.*
Ganglionic reaction absent in the majority of cases. When present, one gland acutely inflamed and generally suppurates. Pus often inoculable, producing a chancroid.	All the superficial inguinal ganglia, on one or both sides, enlarged and indurated; distinct from each other, freely movable; painless, and rarely suppurate. Pus never inoculable.
Prognosis.	*Prognosis.*
Always a local affection, and cannot infect the system. "Specific" treatment by mercury and iodine always useless, and, in most cases, injurious.	A constitutional affection. Secondary symptoms, unless prevented or retarded by treatment, declare themselves in about six weeks from the appearance of the sore, and very rarely delay longer than three months.

TREATMENT.—The chancroid, unless complicated with phagedena, is in most cases self limited, and, in the absence of all treatment

other than cleanliness, will heal spontaneously in the course of from six to eight weeks. Its duration, however, can be shortened by art, and the danger of the formation of a bubo diminished.

The internal use of mercury has no beneficial influence whatever upon the chancroid, which continues in a state of stubborn persistency, or even progresses, after the system is fully under the influence of this mineral. This statement is not a mere inference from the distinct nature of the chancroid and syphilis, but is founded upon experience. I was fully convinced of the fact by personal observation, and ceased to employ mercury for "soft chancres," several years before the distinction between the two species was recognized. Since abandoning it in my own practice, I have had numerous opportunities of observing other surgeons administer mercurials for the chancroid, and my former opinion has only been confirmed. A few years since, during three weeks' absence from the city, I committed five patients with chancroid to the care of a medical friend, and, on my return, found them all salivated, and in every one the sore was aggravated. I could relate many similar instances, in which patients with simple sores have passed from other practitioners under my care, after going through a course of mercury without the slightest benefit.

In most instances no *general* treatment is required except that which common sense would dictate, and which has for its object to place the patient in a healthy condition and thereby enable nature untrammelled to accomplish the work of cure. For this purpose, the secretions should be attended to; a plain but nourishing diet administered; and congestion and inflammation avoided by maintaining a comparative state of quietude. Nocturnal erections are not only painful but interfere with cicatrization, and should be controlled by the means mentioned when speaking of chordee.

At an early period of its existence—say within from three to six days from its commencement—a chancroid may be at once eradicated by the application of a powerful caustic, which will destroy the surrounding tissues to an extent exceeding the sphere of its specific influence. At a later period this object can rarely be accomplished, for the chancroidal virus reappears in the wound left on the fall of the slough; but a repetition of the cauterization exerts a powerful modifying influence upon the action of the ulcer and hastens the reparative period.

Destructive cauterization as a means of hastening the cicatrization of the chancroid, and not for the vain purpose of preventing constitutional infection, was first employed by Richond des Brus in 1826.

This surgeon limited its use to the commencement of the sore, but it has since been extended by Ricord to every stage with the exception of the reparative.

The destructive method, if applied sufficiently early, prevents the occurrence of virulent buboes by removing the source from which the virus enters the lymphatics; but if deferred until a bubo has commenced, the latter goes on to suppuration unchecked, and may furnish inoculable pus in the same manner as if the chancroid had been allowed to remain. Even the sympathetic bubo is often benefited by destruction of the ulcer and undergoes resolution.[1]

Destructive cauterization is impracticable when the chancroid cannot be fully exposed, as in consequence of phymosis, concealment within the urethra, os uteri, etc. It is inadmissible in ulcers situated directly over the urethra either in the male or female on account of the danger of opening this passage; for similar reasons, in chancroids of the deeper portions of the vagina, the walls of which are in contact with the bladder, rectum, and peritoneum; in those upon the margin of the meatus, from the fear of the cicatrix occasioning stricture; and finally in all cases in which the presence of other ulcers in the neighborhood, which cannot be subjected to the same treatment, would expose the wound after the fall of the eschar to a second inoculation.[2]

An attempt to remove the chancroid by the knife is rarely successful, since, however carefully the secretion of the sore may first be removed, enough usually remains to inoculate the fresh wound. For this reason, excision should be employed only when a cutting operation is rendered necessary, as by the presence of phymosis and threatening gangrene; and the knife should be carried as wide as possible from the specific sore, and the bleeding surface be freely cauterized with nitrate of silver or nitric acid. On the contrary, the application of caustic leaves the tissues for a time protected by an eschar, and is, therefore, almost always to be preferred to the knife.

Nitrate of silver is too feeble a caustic to be employed except at the commencement of a chancroid, or in wounds and abrasions immediately after a suspicious connection, before the surrounding tissues have become infiltrated with the virus. It is chiefly used for the purpose of destroying the pustule which appears on the second or third day after a successful inoculation. A fragment of

[1] Rollet, Gaz. Méd. de Lyon, March 1, 1858.

[2] De la Méthode Destructive des Chancres, par M. Dron; Annuaire de la Syphilis année 1858, p. 202.

the solid crayon corresponding in size to the excavated ulcer which is exposed by the removal of the epidermis, is pressed into it and allowed to remain until it comes away with the small eschar which is formed. The simple wound which is left speedily cicatrizes.

For the fully developed chancroid a stronger caustic is required, as nitric or sulphuric acid, potassa cum calce, the pernitrate of mercury, chloride of zinc, or the actual cautery. Of these, strong nitric acid and Vienna paste, from the convenience of their application, have deservedly come into the most general use.

Nitric acid is preferably applied by means of a glass rod with a rounded extremity; a "drop bottle," with a tapering glass stopper, the point of which extends nearly to the bottom of the flask, is still more convenient; but a simple piece of wood, as an ordinary lucifer match, will answer. Brushes of fine glass are objectionable, since the filaments are liable to break off upon the surface of the sore and excite irritation. The pain is for an instant very severe when the acid first touches the ulcer, but becomes much less acute on subsequent applications, of which there should be several in order to render the destruction complete. I usually occupy several minutes in making these applications, watching the effect produced, and judging by the changes which take place in the tissues when enough has been applied. Any residue should be carefully removed or neutralized by an alkali, and the neighboring surfaces be protected from contact by the interposition of dry lint. A water-dressing may be substituted as soon as suppuration takes place.

After the fall of the eschar, the surface is still covered for a short time with a slimy secretion, but this soon clears off, and any inflammatory engorgement produced by the caustic subsides, leaving a healthy looking wound, which should be protected from the urine and leucorrhœal discharges in order to insure its speedy cicatrization. If any symptoms of a chancroid remain, the cauterization should be repeated.

I am convinced that nitric acid is far superior to the nitrate of silver which is so commonly employed in the cauterization of the chancroid, and that the latter should never, as a general rule, be applied for this purpose except at the very commencement of the ulcer. Any one may convince himself of this truth by a comparative trial of the two agents. The same sore which continues to extend under the application of the nitrate of silver, will speedily cicatrize under the use of nitric acid repeated, if necessary, every second or third day. Any fears which might be entertained that the frequent ap-

plication of so powerful a caustic would do mischief appear to be groundless.

The liquor hydrargyri pernitratis may be applied in a similar manner; I am not aware, however, that it possesses any advantages over nitric acid, and it is attended with some danger of producing salivation.

Potassa cum calce made into a paste and spread upon the chancroid, where it is allowed to remain from five to fifteen minutes, is another convenient mode of applying the destructive method.

Ricord has of late years employed a paste composed of vegetable carbon mixed with strong sulphuric acid. Its advantages are said to be that it forms a crust which closely adheres to the tissues, and does not fall off until the sixth or eighth day, when cicatrization is far advanced. I have used the carbo-sulphuric paste in a few instances, but not in a sufficient number to speak decidedly of its merits. Thus far, it has not appeared to me to be superior to other caustics, nor so convenient; and it is, I think, little used elsewhere than at the Hôpital du Midi.

A valuable caustic, judging from the high encomiums bestowed upon it by many French surgeons, especially of the Lyons school, is to be found in "Canquoin's paste," composed of equal parts of chloride of zinc and flour, which was first recommended for the destruction of the chancroid by MM. Rollet and Diday. The finely-powdered chloride should be intimately mixed with an equal quantity of flour, which has also been dried by heat, and alcohol added drop by drop until a paste is formed, which is to be spread in a thin layer upon cloth, and again subjected to gentle heat. Should deliquescence subsequently take place, the paste may readily be dried again without losing its caustic power.[1] When required for use, a disk corresponding in shape to the chancroid, and slightly exceeding it in size, is cut out and retained upon the surface, previously cleansed of matter, from one to three hours, and in large or phagedenic ulcers for five or six hours. Two hours is the average duration required for ordinary cases. The patient should keep his bed until the paste is removed; and, since only one surface of the plaster is covered with caustic, the prepuce may be drawn forwards, when the sore is situated upon its internal surface, or upon the glans, without danger of injury to the sound tissues.

The advantages of Canquoin's paste are its facility of application and freedom from the danger to which all liquid caustics are liable

[1] Debauge, Traitement des Chancres Simples et des Bubons Chancreux par la Cautérisation au Chlorure de Zinc; Thèse de Paris, 1858, p. 12.

of involving the sound tissues; the small amount of pain which it excites, and the possibility of graduating the depth of its destructive action, which is directly proportioned to the length of the application.

An improved formula is the following:—Take of dried chloride of zinc, two parts; of flour, four parts; and of glycerine, one part. Prepare the paste in the usual manner and roll it into a sheet three millimètres in thickness, which should be covered with a thick layer of flour and be exposed to the air for two days. (Arch. Gén. de Méd., March, 1863, p. 357.)

But little dependence can be placed upon any therapeutic effect from the ingredients of the lotion or dressing applied to a chancroid. I do not mean to imply, however, by this remark that local treatment is unimportant. Neglect in this direction may result in decided injury; while proper attention will put the ulcer in the most favorable condition for cicatrization to take place. If the secretion be allowed to accumulate and stagnate—if scabs be permitted to form under which matter may burrow, ulcerative action will be favored, and also successive inoculations in the neighborhood. These evils may be obviated by cleanliness, and by such form of dressing as will absorb or remove the pus as fast as it is secreted, assisted by astringents or disinfectants for the purpose either of hardening the surrounding surface or neutralizing the virus. But this, I think, is about all that local applications can accomplish. To attribute to them specific virtues, as, for instance, to suppose that mercurial applications possess any power over the sore because it is a chancroid, is to my mind absurd. In short, topical remedies have the same influence upon a chancroid as upon simple ulcers, and do not affect its specific character.

It is highly desirable to aim at simplicity in the local treatment of the chancroid; though applications must be varied somewhat to correspond with the situation of the ulcer, and the copiousness of the discharge.

Chancroids situated beneath the prepuce, when this fold of integument habitually covers the glans, may be dressed with dry lint, which will be sufficiently moistened by the natural secretion of the part. It is often essential, however, for their speedy cicatrization, to effect their complete isolation from the natural secretion of the part, and this can only be accomplished by retracting the prepuce and dressing them as we would chancroids of the integument of the prepuce. In such cases, I am in the habit of using the following dressing:—I first apply to the sore a small piece of lint soaked in

some astringent lotion, cover this with a bandage wet in the same fluid, and complete the dressing with oiled silk and a final retentive strip of muslin. Under this dressing, sores which for weeks have refused to heal will often take on speedy reparative action. No danger from œdema need be feared, provided the bandage be equably and not too tightly applied as far as the corona glandis. The dressing should be changed often enough to keep it moist.

Lotions are necessary when the sore is situated upon the external integument, in order to keep it moist and prevent the dressing from adhering to the surface, and this object may be still farther promoted by covering the dressing with oiled silk.

In most cases, the lotion may consist of simple water or glycerine; when medicated, such ingredients should, as a general rule, be added as will not leave a deposit or change the aspect of the sore, and thus render its condition obscure. The following formulæ are among the best:—

℞. Liquoris sodæ chlorinatæ ʒj.
Aquæ puræ ℥ij.
M.

℞. Acidi nitrici diluti ʒj.
Aquæ puræ ℥viij.
M.

℞. Vini aromatici ℥j.
Aquæ ℥iij.
M.

A formula for a convenient substitute for the French aromatic wine may be found on page 182. The strength of these lotions must be adapted to the sensibility of the part, which varies in different cases. They should never be so strong as to excite pain or produce irritation.

The black wash, composed of from one to three scruples of calomel to four ounces of lime-water, is a favorite application with many surgeons. The dark-colored sediment in this mixture is an oxide of mercury, and is inert unless it affords mechanical protection to the sore. In my opinion, black wash is a less cleanly and less desirable lotion than those before mentioned.

A solution of the potassio-tartrate of iron, in the proportion of from two to eight drachms of the salt to six ounces of water, is much employed by Ricord, especially in the treatment of phagedenic ulcers. In many cases this application acts very favorably; while in others, I have found that the sore became covered with a dingy coating of coagulated matter, which obscured its condition, and required to be

removed by a water dressing. I have only observed this unpleasant effect when the application has been made to sores beneath the prepuce, and have been inclined to attribute it to a combination of the iron with the *smegma præputii.*

Lotions of acetate of lead are objectionable, since this salt is decomposed when brought in contact with the animal secretions, and an insoluble albuminate of lead, which is with difficulty removed, is deposited upon and incrusted in the tissues.

Unguents are less desirable applications than lotions, and should only be employed when, from the position of the sore, or from the necessarily long intervals between the dressings—as at night or during a journey—the evaporation of a water dressing cannot be prevented, even with the assistance of oiled silk and glycerine. Mercurial ointment, which, as procured in the shops, is generally rancid or rapidly becomes so, is irritating and especially objectionable. One of the following formulæ may be employed when an unctuous dressing is required. The first is much used in French hospitals.

℞. Cerati simplicis ℥j.
Tincturæ opii ʒj.
Calomelanos gr. xxxvj.
M.

℞. Balsami Peruviani,
Olei ricini, āā ℥j.
M.

℞. Ung. sinci oxidi ℥j.
Pulv. opii ʒj.
M.

The frequency with which local applications are to be changed must be determined by the copiousness of the secretion, which should not be allowed to collect and stagnate, or extend to the surrounding parts.

Before one dressing is soaked with the discharge, another should be substituted. If the first adhere to the surface, it should be carefully moistened before attempting its removal, in order to avoid any abrasion, which, by subsequent inoculation, would increase the size of the sore. The patient should also be directed not to cleanse the ulcer itself, but simply to remove the discharge from the neighboring parts by touching them gently (without friction) with a soft piece of linen. The dressing of most uncomplicated chancroids need be renewed only two or three times a day, but phagedenic ulcers require a much greater frequency.

During the progress of cicatrization, exuberant granulations may spring up and require repression by pencilling with a crayon of nitrate of silver. A superficial application of this agent is also beneficial in relieving the irritability and pain of some ulcers in the progressive and stationary periods.

Other applications than those now mentioned may be required. For instance, in chancroids attended by much inflammation, leeches to the groins or perineum, and poultices or sedative lotions, are of service. Pain should be relieved by the exhibition of opium in large doses internally, and by its application externally.

CHAPTER II.

SPECIAL INDICATIONS FROM THE SEAT OF CHANCROIDS.

THE seat of a chancroid often modifies the symptoms and necessitates changes in the treatment.

CHANCROIDS UPON THE INTEGUMENT OF THE PENIS.—Chancroids upon the integument of the penis often originate in a follicle, and when first noticed resemble a pustule or small abscess. Not unfrequently they extend to the loose cellular tissue, and undermine the skin around a small external opening through which the pus can be made to well up on pressure. The movability of the integument over the concealed chancroid cavity interferes with cicatrization and prolongs the duration of the ulcer. The cavity, first thoroughly cleansed of matter, should be cauterized by means of a sliver of wood (as a lucifer match) dipped in strong nitric acid; or sometimes it becomes necessary to enlarge the external opening even at the risk of inoculation of the edges of the wound.

Chancroids of the Frænum.—Chancroids of the frænum are especially painful, persistent, and exposed to hemorrhage. They may commence either upon the free margin or upon the base of the bridle. In the former case a rent or fissure, the result of violence during coitus, has probably been inoculated; and the resultant chancroid gradually eats away the whole bridle, and hollows out a narrow longitudinal groove upon the under surface of the glans, giving great annoyance, persisting indefinitely, and resisting ordinary modes of treatment. Again, they may proceed from chancroids in the neighborhood, which exhibit a remarkable tendency to involve the bridle, if situated near it. In this case the base of the frænum is first attacked, and often becomes perforated from side to side; the chancroidal opening gradually enlarges, extends to the free margin, and, as in the former case, probably destroys the whole bridle. The frænum is copiously supplied with blood, and exceedingly sensitive; hence ulcers of this part are very liable to bleed and give rise to

much suffering. Their persistency and destructive tendency are due to the frequent rupture of the longitudinal fibres of the frænum, occasioned by the constant motion to which it is exposed, in walking, handling the penis during micturition, in erections, etc. Minute rents are thus caused in the sore which become inoculated and increase its depth; and ulcerative action goes on until the whole bridle is destroyed, including the portion buried in the under surface of the glans; and hence the fossa already referred to.

In the treatment of these ulcers, the patient should be directed to avoid all motions of the part which will stretch the frænum; the glans should not be uncovered except to dress the sore, and even then no farther than is absolutely necessary to insert the dressing. If the chancroid threaten to destroy the whole bridle, time will be gained by accomplishing the same at once by means of caustic. When perforation has taken place, the remaining portion of the bridle should be divided with scissors, and the raw surfaces freely cauterized. The flow of blood in this operation is often troublesome, but may be avoided by previously passing a double ligature through the opening and tying each thread at either extremity of the frænum, all of which should be removed. Diday heats one blade of a dull pair of scissors over a spirit lamp, and passing the opposite cold blade through the opening to serve as a support, thus divides the frænum by the actual cautery.[1]

URETHRAL CHANCROIDS.—As might be supposed, chancroids in the urethra are most frequently found near the meatus; but they may be seated in any portion of the canal, and, in rare instances, even in the bladder. Ricord presented to the Academy of Med. of Paris[2] two specimens of phagedenic chancroid involving the deeper portions of the urethra and bladder, in each of which the disease had been recognized during life by the successful inoculation of the urethral discharge.[3] Vidal, with strange inconsistency, denies the possibility of these cases, and then reports a similar one of his own![4] Many chancroids of the fossa navicularis are visible on forced separation of the lips of the meatus. For the purpose of exploring this portion of the urethra, I am in the habit of using Toynbee's ear-speculum, the uniform calibre of the extremity of which permits its

[1] Du Chancre Primitif du Frein de la Vergé; Gazette Hebdomadaire, Oct. 19, 1855, p. 749.

[2] Bull. de l'Acad. de Méd., 1838, t. ii., p. 506.

[3] These cases are figured in Ricord's Notes to Hunter.

[4] Treatise on Venereal Diseases, 1st Am. ed., N. Y., 1854, p. 209.

introduction for about an inch, and if the patient be placed in direct sunlight, an excellent view of the lining membrane for this distance may be obtained.

When situated beyond the field of vision, urethral chancroids are recognized with greater difficulty, and may be entirely overlooked. The discharge is less copious than in gonorrhœa, and often streaked with blood; pain is felt at a fixed point during micturition, and upon palpation along the course of the urethra; inflammatory engorgement of the neighboring tissues can frequently be felt externally; and there may be a suppurating bubo in the groin furnishing inoculable pus. The coexistence of gonorrhœa renders the diagnosis still more difficult, but even then the pain is especially severe at a fixed point of the canal during the passage of the urine. In doubtful cases, auto-inoculation of the urethral discharge may be relied upon as an unfailing test of the presence of this ulcer.

Urethral chancroids, so near the meatus as to be visible, are to be treated in a similar manner to those situated externally; the dressing, with a thread attached to facilitate its withdrawal, being inserted by means of a probe after each act of micturition. Deep urethral chancroids are not susceptible of much local medication. Injections of a solution of nitrate of silver have been recommended, but neither in this form, nor when the solid crayon is applied by means of Lallemand's instrument, can this agent destroy the specific sore. Topical applications must therefore be limited to injections containing opium, glycerine, or some mild astringent. Relieve inflammation, if necessary, by leeches to the groin; if abscesses form, open them early; and, in all cases, guard against erections which tear and irritate the sore.

Chancroids of the Female Genital Organs.—Upon the external and hairy surface of the labia majora, the chancroidal virus sometimes gains access to one of the hair follicles and gives rise to a follicular chancroid, which may readily be mistaken for a simple abscess. The most frequent seat of chancroids in women is at the posterior commissure of the vulva, where rents, which frequently occur from violent coitus, are readily inoculated in impure intercourse. A simple tear or fissure in this situation is very obstinate owing to the motion upon each other of the opposed surfaces and the exposure to irritation from the urine and vaginal secretions: hence the diagnosis between a simple and virulent ulcer is often difficult, and in some instances can only be determined from the his-

tory of the case, the condition of the inguinal ganglia, or from the results of experimental inoculation of the discharge.

Chancroids of the deeper portions of the vagina cannot be treated by destructive cauterization, owing to the proximity of important parts—an objection which does not apply to those of the os uteri. The local applications employed in external chancroids may be made through a speculum.

According to Gosselin, hypertrophy of the labia majora, whether accompanied or not by that of the labia minora and some of the carunculæ myrtiformes, is so exclusively an effect of chancroids in the neighborhood of the vulva, that its presence is sufficient to justify the conclusion that a woman has at some previous time been thus affected.[1]

CHANCROIDS OF THE ANUS AND RECTUM.—Chancroids of the anus and rectum may occur in either sex from unnatural coitus, but are more frequent in women owing to the facility with which these parts are soiled with the secretion of sores situated upon the vulva. When seated upon the margin of the anus, they may readily be mistaken for fissures. They are attended by much pain, especially during the passage of the feces, which should always be rendered liquid before going to stool by a mucilaginous injection. It is sometimes advisable after clearing out the bowels, to thoroughly cauterize the sore, and to confine the patient to bed and a low diet, and administer opiates for the purpose of preventing any farther stools until cicatrization has taken place.

[1] Arch. Gén. de Méd., Dec. 1854, p. 684.

CHAPTER III.

THE CHANCROID COMPLICATED WITH EXCESSIVE INFLAMMATION AND WITH PHAGEDENA.

EXCESSIVE inflammation terminating in gangrene gives rise to the inflammatory or gangrenous chancroid; and phagedenic ulceration, in several different forms, to as many varieties of the phagedenic chancroid.

INFLAMMATORY OR GANGRENOUS CHANCROID.—The inflammation attendant upon a chancroid is sometimes so excessive as to terminate in gangrene, and produce a slough of the surrounding tissues, like that caused by the application of a powerful caustic. This complication is most liable to occur in cases of congenital or accidental phymosis, in which the sore is imprisoned beneath the prepuce. The extremity of the penis is very much swollen and œdematous, and often of a livid red color; a dark spot of commencing gangrene soon appears, generally upon the dorsal surface, and involves the prepuce to a greater or less extent; the constricted portion, or glans, commonly suffers less than its covering; if the slough include all the tissues in the neighborhood of the chancroid, the latter, when the eschar is detached, presents the appearance of a simple wound, and—it is important to recollect—no longer secretes inoculable pus. The inflammation attendant upon chancroids complicated with paraphymosis may result in a similar manner.

It is evident that excessive inflammation, which is generally induced by mechanical constriction, violence, want of cleanliness, or the abuse of alcoholic stimulants, is to be regarded merely as a complication of the original sore, and does not in itself change its nature. The transformation into a simple ulcer, finally induced in most cases by the supervention of this complication, is due solely to the fact that the tissues surrounding the ulcer are involved in the slough to an extent exceeding the sphere of specific influence of the virus.

Inflammatory or gangrenous chancroids are included by most English writers among the phagedenic, but there would appear to be sufficient reason to follow the classification adopted by the French, and consider them as distinct. Buboes are rare in connection with this variety.

Inflammatory chancroids are to be treated by confining the patient to bed, low diet, mild purgatives, leeches to the groin or perineum, the local application of cold or evaporating lotions, and other antiphlogistic measures, so long as the acute symptoms continue; but if gangrene supervene tonics and stimulants are in most cases required. If the case be complicated with phymosis and the ulcer be concealed beneath the prepuce, the prepuce should be slit up by means of a bistoury carried along a director introduced from the orifice. If the slough of the tissues surrounding the ulcer has been complete there is no danger of inoculation of the edges of the wound; but even when the gangrene is but commencing it is better to run the risk of inoculation than to incur the danger of an extensive loss of tissue from a large slough.

Mr. William Lawrence, whose experience has been very extensive, has the following remarks upon the indications for an operation:—"To determine whether the prepuce should be divided or not is sometimes a difficult matter of diagnosis. The degree of redness, swelling, and pain, will not enable us to decide. The propriety of the measure depends on the condition of the sore which we cannot see. The discharge from the orifice of the prepuce must assist our judgment in doubtful cases. An ichorous or sanious state of discharge, with fetor, indicate sloughing; and in such circumstances the division ought to be performed. If the discharge should be purulent even though somewhat bloody, and the glans tender on pressure, we may be contented with leeches, tepid syringing, and mild aperients."[1] Mr. L. believes the objection unfounded, that the cut edges may become inoculated with the virus, and take on phagedenic action.

PHAGEDENIC CHANCROIDS.—In the chancroid, as commonly observed, the process of ulceration is generally slow and limited in extent, and advances with nearly equal rapidity in all directions; whence the sore maintains a rounded form, and does not involve the tissues to any great extent or depth. Phagedenic chancroids, on the contrary, are characterized by their more rapid, extensive, and

[1] Lectures on Surgery, London, 1863, p. 399.

irregular progress; though these characters vary greatly in degree in different cases.

In the mildest and most frequent form of phagedena, the sore extends in surface and in depth beyond its ordinary bounds; this is sometimes observed at all parts of the circumference, but generally at one part more than another, so that the circular form is lost, and the outline becomes irregular; but yet the ulcerative action is not excessive.

Phagedena may stop here, or go on to form a serpiginous chancroid, to the extent and duration of which there is no limit. The edges of the sore in this variety are thin, livid, and œdematous, and so extensively undermined that they fall upon the ulcerated surface, or may be turned back like a flap upon the sound skin; they are often perforated at various points, and are very irregular in their outline, resembling a festoon. The surface of the sore is uneven, and covered with a thick pultaceous and grayish secretion, through which florid granulations at times protrude, and bleed copiously upon the slightest touch. Serpiginous chancroids are not attended by much constitutional reaction. They exhibit a predilection for the superficial cellular tissue, and are inclined to extend in surface rather than in depth. They sometimes undermine the whole skin of the penis as far as the pubes, or make their way down the thigh nearly to the knee, or upwards upon the abdomen, or follow the course of the crest of the ilium. They often advance on one side, while they are healing upon the opposite. Their progress may appear to be arrested, and the sore nearly cicatrized, when rapid ulceration again sets in and destroys the newly-formed tissue. Their secretion is copious, thin, and sanious, and preserves its contagious properties through the many years that the ulcer may persist. They leave behind them a whitish and indelible cicatrix, resembling that produced by a deep burn.

This sore may be mistaken for the serpiginous ulceration of tertiary syphilis. It is distinguished from it by the fact that it commences with a chancroid—usually seated upon the genitals—or with a suppurating bubo in the groin; that from this point of origin it extends by a continuous process of ulceration, the course of which is evident by the foul cicatrix which it leaves behind it; and that it never overleaps sound portions of the integument. Moreover, the fluidity of its secretion does not favor the formation of scabs, and its contagious properties are manifest if inoculated upon the person bearing it.[1]

[1] Bassereau, op. cit., p. 475.

A third variety is called the sloughing phagedenic ulcer, and is characterized by the greater acuteness of the destructive action. Its symptoms closely resemble those of hospital gangrene. There is considerable constitutional disturbance, a full and hard pulse, furred tongue, and other symptoms of inflammatory fever. The pain is often excessive, and almost insupportable. The ulcer extends chiefly to dependent parts in the neighborhood, which are infiltrated by its copious and foul secretion. It respects no tissue whatever, and its ravages are sometimes terrible; the glans, penis, or labia may be wholly destroyed, and the testicles entirely laid bare. Fatal hemorrhage has been known to occur from ulceration of the arteria dorsalis penis. The sloughing phagedenic chancroid is most common among the intemperate and lowest class of prostitutes, and also among persons visiting hot climates and exposed to various hardships. It was this variety which decimated the English troops in the Peninsular war, although venereal diseases were comparatively mild among the natives.

Phagedenic chancroids are not unfrequently attended by buboes, which generally take on the same destructive action as themselves.

Fournier's confrontations, already referred to, prove that the phagedenic chancroid is not always transmitted in its kind, and that hence it cannot depend upon a distinct species of virus. It does not, however, conflict with this statement to admit that contagious matter may possess noxious properties independent of the contained virus, but capable of exciting a severe form of ulcerative action. This appears not improbable when we consider that vaccine lymph which is derived from unhealthy tissues or allowed to stand in solution until it becomes putrid, may develop such a degree of inflammation as to prove fatal. Witness the mortality in the town of Westford, Mass., in the spring of 1860, following vaccination with scabs originally pure, but which were dissolved in water and exposed to air and heat until they were decomposed.[1] In most cases, however, phagedena is doubtless dependent upon some form of constitutional cachexia, the exact nature of which is not always apparent. The abuse of mercury in the treatment of venereal ulcers is another cause, which was more frequent a few years since than now; and the improved practice of the present day may account in a measure for the partial disappearance of this variety.

The general treatment of phagedenic ulcers should be based upon

[1] Boston Medical and Surgical Journal, May, 1860.

a knowledge of the cause of the destructive action when this can be ascertained. Phagedena most frequently occurs in persons debilitated by various causes, as intemperance, irregularity of life, want, or a residence in damp, unhealthy apartments; in these cases, nourishing food, the ordinary comforts of life, and the mineral or vegetable tonics are required. Scrofula is another fruitful source of phagedena, and calls for preparations of iodine and other antistrumous remedies. Moderate doses of opium repeated at short intervals, so as to keep the patient gently under its influence, are often of essential service in allaying pain, and in controlling the progress of the disease. Numerous observers have called attention to the beneficial effect of this agent upon ulcerative action, and have ascribed to it a decidedly tonic influence. Rodet reports several cases of serpiginous chancroids which resisted a great variety of means, but which yielded to opium. This surgeon commences with about one grain of the gummy extract of opium morning and night, and gradually but rapidly increases the dose so that the system may not become habituated to it before its therapeutic effect takes place. He prefers two large doses in the twenty-four hours to smaller ones more frequently repeated, in order that digestion may go on unimpeded in the intervals. Light wines are largely administered at the same time, and are said to correct any tendency to constipation.

In many cases it is impossible to discover the cause of phagedena. The general condition of the patient is good; all his functions are duly performed; and yet his ulcer continues to extend. In such cases our chief reliance must be placed upon deep cauterization, and the general treatment must be more or less experimental.

The potassio-tartrate of iron is a remedy of great value in phagedenic chancroids, when a tonic is required. Ricord calls this preparation the "born enemy" of phagedena, and attributes to it an almost specific influence upon ulcerative action. I can add my own testimony to that of Ricord and many other surgeons in its favor, and would strongly recommend a trial of it in the class of cases under consideration.

℞. Ferri et potassæ tartratis ℥ss.
Aquæ ℥iij.
Syrupi ℥iij.
M.

From two teaspoonfuls to a tablespoonful of this solution may be taken three times a day, within an hour after meals, and a lotion containing the same salt be applied to the ulcer.

The chief means, however, for the cure of phagedenic chancroids

is to be found in the complete destruction of the sore by a powerful caustic or the actual cautery. In cases of a comparatively mild character, we may rely upon frequent applications of fuming nitric acid, taking care to apply it to every crevice, especially beneath the edges of the undermined integument. If the smallest loophole be left from which virulent pus can proceed, it will inoculate the wound remaining after the fall of the eschar, and the only effect of the treatment will be to increase the size of the ulcer. It is evident, therefore, that cauterization, in order to be a benefit and not an injury, must be thorough and complete. In severe cases Ricord repeats the application as often as twice a day; and in the meanwhile dresses the sore with lint soaked in aromatic wine or a solution of the potassio-tartrate of iron. Pain and swelling are not always contra-indications to the use of the caustic, which is frequently the most effective sedative that can be employed. Robert states that cauterization with the carbo-sulphuric paste has been very successful in his hands. I would suggest a trial of the local application of bromine, which has recently proved so successful in the treatment of hospital gangrene.

Just as these pages are going to press, I learn that a solution of the permanganate of potassa, which is claimed to be superior to bromine in the treatment of hospital gangrene,[1] has been employed at the N. Y. Hospital with great success, as a local application to sloughing phagedenic chancroids, in three cases. A saturated solution (gr. lxxxv. ad aquæ ℥j) was applied every two hours, and the sores dressed between the applications with lint soaked in a mixture containing a drachm of the saturated solution to a pint of water, until the surface of the ulcers cleared off, when the dressing was alone continued. The pain of the application was not severe, and in each instance reparative action was set up in the course of from twenty-four to forty-eight hours. This agent is certainly worthy of farther trial.

In the more severe cases of phagedena, as in serpiginous and sloughing chancroids, when other means have failed, it becomes necessary to resort to a more powerful destructive agent than any of the ordinary caustics. Some hesitation may be felt in applying the actual cautery to so extensive a surface as is often covered by these ulcers; but when the gravity and obstinacy of the disease are considered, it must be confessed that almost any means is justifiable which holds out a fair promise of cure.

[1] See an article entitled: Remarks on the Use of Permanganate of Potassa, by Dr. F. Hinkle; Am. Med. Times, Nov. 28, 1863.

The patient should be rendered insensible by means of an anæsthetic, and the cauterizing irons of different shapes and sizes be raised to a white heat.

Rollet directs that the ulcer should first be cleansed by washing it copiously with water, removing all adherent matter and then drying it. Every portion of the secreting surface should now be deeply cauterized, carrying the hot iron into every nook and sinus, and paying special attention to the parts overlapped by the skin of the edges. These flaps of integument should be cauterized not only upon the under, but also upon the outer surface, so as to be for the most part destroyed. A cold water-dressing is afterwards applied, and the patient, on waking, does not suffer much more than he did before the operation. When suppuration commences, Goulard's extract or aromatic wine may be added to the lotion. Rollet has recently reported two cases of success by this method.[1]

An attack of erysipelas has been known to arrest the progress of phagedena and to induce cicatrization of serpiginous ulcers which had proved intractable under almost every form of medication. An instance of this kind is contributed by M. Buzenet to Ricord's *Leçons sur le Chancre*, and several are reported by other surgeons.

[1] Note sur la Destruction du Chancre Phagédénique Serpigineux par la Cautérisation Actuelle; Annuaire de la Syphilis, 1858, p. 116.

CHAPTER IV.

THE CHANCROID COMPLICATED WITH SYPHILIS.—"MIXED CHANCRE."

SYPHILITIC infection of the system presents no barrier to the existence of a chancroid, and *vice versâ*. Universal experience confirms the statement that a person presenting syphilitic symptoms, whether primary, secondary or tertiary, may contract a chancroid, which will run the same course as in a person free from syphilis. Moreover two inoculations, one with the chancroidal and the other with the syphilitic virus, may occur side by side, and the resultant chancroid and chancre will each pursue its normal course uninfluenced by the neighborhood of the other; and, finally, two such inoculations may take place at one and the same point and produce a sore possessing all the properties of the chancroid and the primary syphilitic ulcer, viz.: on the one hand, auto-inoculability and the power of producing a suppurating bubo secreting inoculable pus; and on the other, an indurated base, induration of the neighboring ganglia, and a secretion capable of communicating syphilis to a person free from previous syphilitic taint.

I have denominated such a sore a "chancroid complicated with syphilis." It would clearly be just as appropriate to call it "primary syphilis complicated with the chancroid." The French have named it the "mixed chancre." The implantation of the two kinds of virus may take place synchronously, as, for instance, in the same act of coitus when a man has connection with a woman affected with a chancroid and also with syphilitic manifestations; or the inoculation of either virus may occur upon a previously existing ulcer of the opposite species. In either case, when once developed, the mixed chancre may be perpetuated in its kind by successive inoculation from one individual to another.

The following instance in which a mixed chancre was developed by the inoculation of a primary syphilitic ulcer with the chancroidal virus, is reported by Fournier:—

Alphonse N., aged 17, contracted a chancre in the latter part of Sept., 1857. He became an out-patient of the Hôpital du Midi, Oct. 3, when a chancre, surrounded with cartilaginous induration, was found in the fossa behind the corona glandis, and the glands in both groins were enlarged, hard, and indolent. A dressing with aromatic wine was ordered for the sore, and mercury internally.

Oct. 14. The chancre has entered upon the period of repair; it is less excavated, and its edges less prominent.

Oct. 24. There has been a change for the worse. The original chancre has increased in surface and in depth; its base is still very much indurated. Moreover, upon the skin of the penis is found another large ulcer; its base œdematous, but without true induration. There are also several small ulcers with soft bases upon the external surface of the prepuce. The patient declares most positively that he has had no sexual connection since he contracted his first chancre. Are the recent sores to be attributed to accidental inoculation from the first? N. is this day admitted as an in-patient.

In the early part of Nov. one of the lymphatic ganglia in the left groin became acutely inflamed, and presented all the characters of a bubo dependent upon a chancroid. It suppurated, and *its pus was inoculated with success.* In the right groin, the enlargement and induration of the ganglia characteristic of a chancre remained as before.

In Dec. secondary symptoms appeared; roseola and multiple mucous patches.

In spite of the patient's denial, Ricord attributed the more recent ulcers to a second exposure and fresh contagion; and a few days after his entrance into the hospital, the patient privately confessed to M. Fournier, the Interne, that on Oct. 15th he had connection with a woman whose name and address he gave. He also stated that on the following day his first ulcer began to enlarge, and the others appeared two days after.

Fournier immediately visited the woman indicated by N., and found that she had three large chancroids with perfectly soft bases, situated upon the internal surface of the left labium, on the fourchette and upon the folds at the entrance of the vagina, and of about three weeks' duration. The inguinal ganglia were in a normal condition.

This woman also confessed to M. Fournier that she had infected her lover, Charles V., who, by a singular coincidence, was at that moment a patient in the Hôpital du Midi, and who likewise had several chancroids with soft bases upon the prepuce and an acute bubo in the left groin.

To sum up this history: a man with a primary syphilitic ulcer in the period of repair and an indolent indurated bubo has connection

with a woman affected with chancroid. He contracts fresh ulcers which prove to be chancroids, and one of which is seated upon the surface of the original chancre. An inflammatory bubo appears, which suppurates and furnishes inoculable pus. Finally, symptoms of general syphilis are developed.[1]

Rollet relates a similar case:—

G. Francois, aged 20, entered the Antiquaille Hospital, at Lyons, with a sore situated upon the meatus, and which was slightly indurated and presented the usual aspect of a chancre. The fossa at the base of the glans was also studded with several ulcers which were as soft as possible. The ganglia in the groin were indurated. In six weeks after exposure, the patient was attacked with headache, syphilitic roseola, and rheumatic pains.

In order to confirm the diagnosis as to the nature of the sores, Rollet inoculated matter from the one which was indurated upon the left thigh, and the secretion of the others upon the right. The result was positive in both. It was then thought that pus from the simple sores might have been deposited upon the indurated one, and thence taken up upon the lancet. Rollet therefore waited until the chancroids in the fossa behind the corona had completely healed, and then, after repeatedly cauterizing the indurated sore with solid nitrate of silver, inoculated its secretion a second time. This inoculation produced the characteristic pustule of a chancroid as before; thereby showing that the success of the first inoculation was not owing to the presence of matter which had been simply deposited and again taken up, but to the inherent properties in the secretion of the sore itself.[2]

M. Rollet and his Interne, M. Laroyenne, were led by this case to try the effect of inoculating chancres with matter from a chancroid. Their experiments are briefly related as follows:

Case 1. Pieri M.; indurated chancre of the meatus; duration three weeks; indurated ganglia; inoculation of the secretion of the chancre, negative. Sept. 14, the pus of a chancroid was deposited upon the sore. Sept. 15, application of the solid nitrate of silver; lotions; dressing with aromatic wine. Sept. 19, second inoculation; chancroidal pustule.

Case 2. John L.; indurated ulcer almost healed; indurated ganglia; general treatment and local application of aromatic wine; inoculation negative. Nov. 18, pus from a chancroid is applied to

[1] Leçons sur le Chancre, p. 119.

[2] Laroyenne, Études Experimentales sur le Chancre, Annuaire de la Syphilis, année 1858, p. 248.

the ulcer; treatment continued. Nov. 23, second inoculation; this time positive.

CASE 3. Robert M.; parchment variety of chancre upon the skin of the penis; duration five days. Dec. 11, inoculation without result; dress with opiated cerate and calomel. Dec. 16, application of the virus of a chancroid. Dec. 17, same dressing. Dec. 22, inoculation positive.

CASE 4. Peter M.; chancre of six weeks' duration, occupying three-fourths of the circumference of the fossa glandis. Dec. 11, inoculation unsuccessful. Dec. 16, application of the virus of a chancroid. Dec. 17, dress with opiated cerate with addition of calomel. Dec. 22, inoculation successful.

According to Rollet, two or three days after the application of the virus of a chancroid to a chancre, the sore assumes a grayish aspect like an ordinary chancroid, but is less excavated; its edges become jagged, and its purulent secretion more copious and sanious; it may give rise to successive chancroids in the neighborhood or to a virulent bubo. It preserves, however, the essential characters of a chancre, and, among others, induration of its base, which is always pathognomonic; the ganglia of both groins are indurated as usual, unless a virulent bubo supervenes, when those of the opposite side may still indicate the nature of the disease. The general symptoms following the chancre are not modified by this inoculation, and secondary symptoms appear at the same time and in the same manner as under ordinary circumstances. The more copious secretion of the chancroid renders this species more liable to be ingrafted upon a chancre than the latter upon the former.

Thus far we have supposed the inoculation of one species of virus to succeed that of the other, but both sometimes, though rarely, occur during the same act of coitus. In this case the chancroid, which has no period of incubation, is first developed in its usual form, with abrupt edges, grayish floor, and soft base; subsequently the chancre appears, when the base of the sore and the neighboring lymphatic ganglia become indurated. If, as is probably true, those chancres which are auto-inoculable belong to the mixed variety, we may obtain some idea of their frequency from the inoculations of Ricord, Fournier, Puche, and others; about two per cent. of which have been successful. Rollet's observations make the ratio about five per cent. Rollet is inclined to believe that the ulcer which has been described by Carmichael, Ricord, and Royer as the "ulcus

elevatum," is a mixed chancre, which generally shows a tendency to become elevated above the surrounding surface.[1]

The union of the two species of virus in this variety is analogous to the mixture which takes place when gonorrhœa is complicated with urethral chancre, constituting the only true "gonorrhœa virulenta;" and also to the union of either the chancroidal or syphilitic virus with that of vaccinia, of which a number of examples are recorded.

The mixed chancre requires the local treatment of the chancroid and the general treatment of syphilis.

[1] Rollet, De la Pluralité des Maladies Vénériennes; Gaz. Méd. de Lyon, No 7, 1860.

CHAPTER V.

BUBOES.

BUBO, derived from the Greek "βουβων, the groin," etymologically signifies any tumor of the inguinal glands; and the term has also been applied to glandular swellings of other parts of the body, as the axilla, neck, etc. Many affections, distinct in their nature and origin, have thus been confounded under a common name, which, unless limited by some qualifying epithet, conveys but a very vague meaning. As generally employed, however, the term bubo signifies an affection of the lymphatic ganglia of venereal origin; and I would still farther limit its application to those venereal affections of the ganglia which are attended by symptoms of inflammation and which frequently terminate in suppuration; thus excluding the "induration of the ganglia" which accompanies a primary syphilitic ulcer.

In the great majority of cases buboes are dependent upon the presence of a chancroid; but they may also be caused by a gonorrhœa or by excessive venery. They are never due to uncomplicated balanitis. A primary syphilitic sore, or chancre, is accompanied by induration of the ganglia, which never suppurate unless under the influence of some additional exciting cause. The occurrence of buboes is favored by a strumous constitution, by irritant applications to a chancroid, by mechanical violence, undue exercise, excesses in diet, and by sexual intercourse during the existence of a chancroid or gonorrhœa. Men are much more exposed to them than women. It has been estimated that 40 out of every 100 men with chancroids are attacked with buboes; and of these 40, that from 30 to 35 have suppurating buboes; while of every 100 women affected with chancroids, only 20 have acute inflammation of the ganglia, of which 15 suppurate.[1] The influence of the virus of a chancroid upon the ganglia is limited to those which are nearest the ulcer in the course

[1] Notes of Prof. Zeissl's lectures, 1862–3, for which I am indebted to Dr. E. T. Caswell, of Providence, R. I.

of the lymphatic circulation; and it is always the superficial, and never the deep ganglia which are affected.

Buboes may be divided into, 1st, the simple inflammatory bubo, 2d, the virulent bubo, and, 3d, the indolent bubo. The first two are characterized in common by symptoms of acute inflammation. They differ in that the first is capable of resolution, but, when terminating in suppuration, secretes simple pus; while the second, dependent upon absorption of the chancroidal virus, necessarily suppurates and furnishes inoculable pus. The indolent bubo, as its name indicates, is marked by its subacute character, and, as it most frequently occurs in strumous subjects, is sometimes called the "strumous or scrofulous bubo."

SIMPLE INFLAMMATORY BUBO.—This is also known as the "sympathetic" bubo,—a term employed to denote a relationship, as cause and effect, between a gonorrhœa or chancroid and the inflammation of the ganglion, but the exact nature of which relationship is not always apparent. We may suppose that in some instances irritant matter is conveyed along the lymphatics, or that common inflammation traverses the course of these vessels; or that an unknown sympathy or bond of union exists between the surface and the corresponding ganglion, whereby disease of the one produces morbid action in the other. This explanation of the origin of inflammatory or sympathetic bubo is confessedly unsatisfactory, but is the best that can be given in the present state of our knowledge. Analogous instances are found in the inflammation and suppuration of glands in other parts of the body, as the axilla, in consequence of wounds of the fingers, excessive manual labor, prurigo, eczema, etc.

The symptoms of simple adenitis are well known. Most frequently only one gland is affected; if others are involved, they are commonly so to a less degree. The patient first notices a swelling in the groin attended with tenderness on pressure, and pain which is aggravated by motion or the standing posture. The gland is felt to be somewhat enlarged, but is still movable beneath the integument which preserves its normal color; and the surrounding cellular tissue is evidently thickened by infiltration. This condition may last for an indefinite period—during the continuance of the ulcer or even after its cicatrization, and yet finally disappear without suppuration.

In less fortunate cases, the inflammatory symptoms increase in severity; the tumor acquires larger dimensions and becomes adherent to the skin and underlying fascia so that it is no longer movable;

the pain and tenderness are increased; motion is difficult; the skin becomes reddened; suppuration is ushered in by a chill; the presence of matter is indicated by a soft spot in the midst of the general hardness and soon after by distinct fluctuation; and although resolution is still possible, yet commonly the contents of the abscess are discharged through an opening in the integument formed by the process of ulceration. In the great majority of cases I believe that the seat of the suppuration is in the cellular tissue surrounding the gland and not in the gland itself. The original congestion or inflammation of the glandular tissue appears to undergo resolution after exciting a similar process in the loose cellular tissue of the neighborhood which more readily takes on suppurative action; and when the abscess is opened by nature or art, the gland may often be seen within the cavity already covered with granulations destined to commence the work of repair.

I have spoken of the simple inflammatory bubo as affecting one ganglion, but it sometimes happens that two or more are involved, when several collections of matter may form, which by their early union may give rise to one large abscess; or they may remain distinct or only communicate after the opening of one of them. Not unfrequently these collections of matter are separated by Poupart's ligament, one being situated in the groin and the other upon the upper and inner part of the thigh.

The course of a bubo subsequent to the evacuation of the contained matter varies in different cases. In healthy subjects and under proper treatment, the cavity may rapidly contract and fill with granulations, its walls unite and cicatrization take place, leaving a slight scar scarcely perceptible after the lapse of a few months. In less fortunate cases, secondary abscesses form in the neighborhood even after the first has been opened, and communicating with the cavity of the latter, give rise to fistulous passages which are often several inches in length. Or, again, instead of having a distinct point of origin, a fistulous track may shoot out from the cavity itself. The opening may have been free, allowing ample exit to the matter, and the process of repair appear to be going on propitiously, when suddenly without apparent cause the surgeon in passing his finger over the surface notices a hardened chord beneath the skin, or in probing the cavity discovers a new fistulous track, which has formed insidiously without giving the slightest indication of its presence. In short, a line of infiltration of the cellular tissue has, as it appears, started from the original abscess, and by a process of suppuration opened a new fistulous track; and thus the cellular

tissue beneath the skin may become riddled with false passages of various lengths and running in various directions, and which remind one of the burrowings of a mole in a hay-field. In whichever mode developed, these fistulous tracks most frequently run along Poupart's ligament either upwards and outwards towards the anterior superior spine of the ilium, or downwards and inwards to the inner fold of the thigh. In rare instances they penetrate nearly perpendicularly to the surface for some distance. Their walls become covered with a kind of false membrane which secretes a thin purulent matter, and the surrounding tissues are more or less brawny to the touch.

VIRULENT BUBO.—The virulent bubo receives its name from the fact that the pus which it contains is contagious, and will, upon artificial inoculation, give rise to a chancroid.

A virulent bubo may form either at an early or late period of the existence of a chancroid. M. Puche reports a case in which it first made its appearance three years after the commencement of a serpiginous chancroid.[1]

A virulent bubo is due to the absorption of virus from the surface of a chancroid, and its conveyance by means of the lymphatics to the ganglion; here its farther progress is arrested in the intricate meshes and minute ramifications of this body, and its presence gives rise to inflammation which assumes the specific character of the exciting cause. The same power of reproduction is manifested which gives to virulent pus its contagious qualities, and the abscess which necessarily ensues is filled with inoculable matter. Resolution is as impossible and suppuration as inevitable as if the secretion of the chancroid had been deposited within the ganglion upon the point of a lancet.

Virulent adenitis is usually situated upon the same side as the chancroid, but sometimes upon the opposite, owing to the interlacement of the lymphatic vessels upon the dorsum of the penis. Sometimes both groins are affected, especially when the ulcer is situated upon any part in the median line, as the frænum. It is very rare for more than a single gland on one or both sides to suppurate specifically; and hence the virulent bubo is said to be "monoganglial." Other ganglia in the neighborhood may, however, be secondarily affected through sympathy or extension of the inflammatory process, but should they suppurate, the pus is not inoculable like that of the first ganglion.

[1] RICORD, Leçons sur le Chancre, p. 40.

Prior to its spontaneous or artificial opening, the course of a virulent is the same as that of a simple bubo, and the student should understand that the early symptoms of the two are identical; though the distinction between them is fully justified by the inevitable suppuration and specific properties of the one, and the possible resolution and simple character of the other.

During the formation of this bubo, the virulent pus is confined to the interior of the affected ganglion; but at the same time simple inflammation and suppuration are going on in the surrounding cellular tissue as in the simple inflammatory bubo, and hence there are two collections of matter separated by the wall of the ganglion; the one within containing chancroidal, and the one without simple pus. Now if the bubo be left to itself, the external abscess commonly breaks before the internal, and consequently the pus which first flows out is simple and not inoculable, and the cavity of the abscess may be covered with healthy granulations like that of the simple inflammatory bubo. In the course of a few days, however, the glandular abscess discharges its virulent matter which inoculates the surface of the cavity, and the latter puts on all the characters of a chancroid; its interior becomes covered with a grayish diphtheritic deposit, its edges are everted and undermined, and its secretion is auto-inoculable, or if it accidentally comes in contact with any solution of continuity, as a leech bite, in the neighborhood, it will give rise to a chancroid. The same can be demonstrated when opening the bubo artificially; if a superficial incision first be made so as to penetrate the external abscess only, and a drop of the exuding matter be inoculated; and if subsequently the knife be made to penetrate the glandular abscess, and some of its contents be also inserted beneath the epidermis, it will be found that the former inoculation will fail while the latter will succeed.[1]

Secondary abscesses may form in the vicinity of the gland first affected in the virulent, the same as in the simple inflammatory bubo, but virulent pus does not appear in them except as the result of inoculation from the original abscess. Again, fistulous passages may be produced in the manner already described. If the chancroid

[1] "Equally instructive examples (that the glands collect hurtful ingredients, and thereby afford protection to the body) are afforded by the history of syphilis, in which a bubo may for a time become the depository of the poison, so that the rest of the economy is affected in a comparatively trifling degree. As Ricord has shown, it is precisely in the interior of the real substance of the gland that the virulent matter is found, whilst the pus at the circumference of the bubo is free from it; only so far as the parts come into contact with the lymph conveyed from the diseased part, do they absorb the virulent matter." (VIRCHOW, *Cellular Pathology*, p. 187.)

upon the genitals be complicated with phagedena, the open bubo generally follows the same course; and hence arise those extensive and foul chancroidal ulcerations of the groin which are occasionally seen in hospitals, and which are depicted in nearly all illustrations of venereal diseases.

INDOLENT BUBO.—One or more ganglia, seldom exceeding two or three, are commonly involved in the indolent or scrofulous bubo. The subacute character of the inflammatory process is the chief characteristic of this form of bubo, which closely resembles the well-known strumous inflammation of the glands of the neck in children. The inguinal tumor is less firm and of a more doughy feel than in the buboes above described. A moderate amount of pain, tenderness on pressure, and difficulty of motion, may be complained of by the patient, but these are rarely severe or of long continuance. The tumor very slowly enlarges, perhaps to the size of a hen's-egg, and loses its mobility in consequence of contracting adhesions to the neighboring tissues. The skin covering it becomes thin and of a livid red color, and fluctuation can be detected without being ushered in by chills and fever, as in the inflammatory bubo. If an opening now be made with the lancet, the young surgeon is surprised to find that nothing resembling ordinary pus flows out, but merely a thin, flaky, watery-looking fluid. If, on the other hand, the tumor be left to itself, several openings usually form spontaneously at different points of the surface, and the skin included between them, being deprived of its vascular supply, loses its vitality and gives way. The glands thus exposed are found to be more or less disorganized: they are of a spongy and friable texture, and infiltrated with thin purulent matter which can be made to exude upon pressure from the numerous openings upon their surface. The external opening is still farther enlarged by retraction of the skin, and the mass of swollen and disorganized glands often projects above the level of the surrounding integument, and, acting like a foreign body, interferes with cicatrization of the wound. Fistulous tracks may form, running in various directions, as in the inflammatory and virulent buboes; and gangrene or phagedena may set in, giving rise to extensive, foul, and obstinate ulcerations, and attended with great restlessness, anxiety, a small and frequent pulse, a dry and coated tongue, and other symptoms of general depression. The indolent bubo is frequently met with in private practice, but the complications just mentioned are rare, except among the lower classes who frequent our charity hospitals.

The older writers on venereal admitted the existence of a so-called "bubon d'emblée" or "non-consecutive bubo," arising independently of any lesion of the genital organs, secreting inoculable pus, and attended by syphilitic infection of the constitution, and which, as was supposed, was due to absorption of the syphilitic virus through the sound integument without local reaction at the point of infection. The admission of such a bubo as this is entirely inconsistent with the present state of our knowledge. It is indeed true that buboes sometimes occur without any appreciable lesion of the genitals, but they belong either to the simple inflammatory or indolent forms above described, and, as stated by Ricord, "are occasioned by sympathetic reaction consequent upon irritation of the extremities of the absorbents during coitus, as may occur after any non-specific excitation of the part." A bubo secreting inoculable pus can depend only upon a chancroid situated either externally or concealed within a mucous canal, as the urethra, vagina, or rectum; and syphilitic infection of the system cannot take place without a chancre appearing at the point of inoculation. Diday, who has especially studied the bubo arising under the circumstances mentioned, assigns to it the following characteristics:[1]

1. A long period of incubation, which is usually of about three weeks' duration.

2. A few days before the appearance of the bubo, the patient suffers from general disturbance of the system, inability to sleep, heat and dryness of the skin, irregular chills, lassitude, loss of appetite, and pain in the lumbar region. These symptoms precede rather than follow the evolution of the bubo, do not correspond with it in intensity, and diminish as it progresses.

3. The inflammation is always subacute. The tumor is slow in forming; the pain and sensibility are slight; and if suppuration take place, the skin does not become reddened nor matter form in the surrounding cellular tissue, as almost invariably occurs in virulent adenitis.

4. It is of long duration, and under the most favorable circumstances generally persists for at least a month.

5. It suppurates in about one case out of every four; *but the opening of the abscess is never transformed into a chancroid, and the pus can never be artificially inoculated.*

6. *Constitutional syphilis never follows when this has been the only venereal symptom.*

[1] Nouvelles Doctrines sur la Syphilis, p. 186.

TREATMENT OF BUBOES.—The objects to be attained in the treatment of buboes are, to subdue inflammation and avert suppuration, if possible; or, if not, to hasten the cicatrization of the ensuing abscess.

When the bubo is virulent and specific pus is imprisoned within the ganglion, all attempts to effect resolution will certainly fail; but as this species cannot, at an early period, be distinguished from a simple bubo—although the presence of a chancroid upon the genitals may lead us to suspect it—we cannot in practice discriminate these cases, and must treat all inflammatory buboes as if dispersion were possible. This happy result is not, indeed, attained in the majority of cases, but inaction will never satisfy the patient, and the success of remedies in a few instances will amply compensate for their employment in all; since a suppurating bubo is a source of considerable pain and great annoyance, generally necessitates confinement in bed for several days at least, exposes the patient to detection, and may leave an indelible cicatrix. The idea formerly entertained that danger would result from the "repulse of matter" if buboes were dispersed, is now known to be without foundation.

The means employed to effect resolution are an antiphlogistic regimen (rest and low diet), cathartics, local depletion, counter-irritants, and compression.

General Treatment.—General remedies are not always required. When the inflammation is subacute, local applications may be relied upon from the first.

Rest is of course of the first importance; and the more absolute, the better. It would appear that common sense would suggest this to every one with a commencing bubo, but if the surgeon rely upon the patient's intelligence alone, he will in most cases be disappointed, and will find that the swelling has been aggravated by a long walk, or by what is equally detrimental, the standing posture. Rest upon the back should in all cases be secured, if possible. An active cathartic at the outset will rarely be amiss, and an evacuation from the bowels should be obtained daily. If the patient be of full habit, his diet should be low; but when the system is already depressed or cachectic, strict abstinence will favor suppuration, and should be avoided.

Similar rules should govern the use of local depletion, the benefit from which, however, is so uncertain as scarcely to compensate for its inconvenience; yet when the patient is plethoric, and the local symptoms acute, from six to a dozen leeches may be applied near

(not upon) the tumor, and the bleeding be promoted by immersion in a hot bath; but leeches should never be used when an abscess has formed and is upon the point of opening, lest their bites be inoculated and transformed into chancroids. The administration of a solution of Epsom salts and tartar emetic may often be advantageously substituted for abstraction of blood in any manner.

No benefit can at this period be expected from specific remedies. Mercury is uncalled for, since the inflammation is not at all dependent upon the action of the syphilitic virus. I have frequently employed iodide of potassium, but never with perceptible effect unless in strumous subjects. Prof. Hebra recommends the administration of Zittman's decoction in the indolent or scrofulous bubo.

The large number of local applications recommended in the early treatment of buboes proves how little dependence can be placed upon any of them. Nearly all of them act as counter-irritants, or aim to produce absorption and resolution by compression. To this remark ice is an exception, which if applied to a bubo at its very commencement before acute inflammation is set up will sometimes discuss it.

Counter-irritants.—One of the best counter-irritants is the strong tincture of iodine. I do not attribute its beneficial action to any special power of inducing absorption, but rather to the inflammation of the skin which it excites. The same may be said of the following ointment, which I am also in the habit of using:—

℞. Potassii iodidi ℈j.
Iodinii gr. v.
Unguenti hydrargyri ʒj.
M.

Either of these preparations may be applied twice a day until as much inflammation is induced as the patient can well bear, when the application must be less frequent.

A strong solution or the solid crayon of nitrate of silver is another excellent counter-irritant highly recommended by Mr. Henry Thompson,[1] whose paper on the subject first induced me to try it. The strength of the solution is three drachms of the nitrate of silver to the ounce of water with the addition of twenty minims of strong nitric acid. This should be freely applied to the whole surface of the tumor and be repeated as soon as the eschar comes away; or the solid nitrate of silver may be employed by first moistening the part with water and then rubbing the crayon for a few minutes upon it.

[1] London Lancet, Am. ed., June, 1855, p. 536.

A blister may be employed for the same purpose and the vesicated surface be dressed with various irritant or resolvent ointments. When the acute symptoms have somewhat subsided, or at the outset of virulent buboes, Ricord recommends that the blister should be dressed twice a day with half a drachm of strong mercurial ointment, and be covered with a rye-meal poultice which should be changed three or four times in the twenty-four hours. A caustic solution of the bichloride of mercury, proposed by MM. Malapert and Reynaud for the treatment of buboes after suppuration has taken place, has also been employed by some surgeons for the purpose of inducing resolution.

A few years since a favorite mode of treatment of subacute buboes in the French hospitals was by means of "cautérisation ponctuée," or the rapid application of a pointed iron heated to a white heat to numerous points over the tumor. This method was tried at my suggestion at Bellevue Hospital in this city with very satisfactory results. The dread rather than the pain of the application, which does not exceed that produced by many caustics, interferes with its adoption in private practice.

Compression.—Compression is another means employed to induce resolution of buboes, and is said to have been suggested by the observation that these tumors do not occur wherever a truss is worn. The most ready method of applying pressure is by means of compressed sponge and a spica bandage, and the application of hot water to cause the sponge to swell. An Interne of the Hôpital du Midi has invented a truss or pad for the same purpose, consisting of a rounded piece of wood covered with leather, and provided with straps to pass round the waist and thigh. This may be obtained at most instrument makers, and is very convenient and serviceable. It is generally called "Ricord's pad for buboes." Reynaud[1] combines heat and pressure by heating the half of a common brick, the edges of which have been chipped off, wrapping it in a napkin, laying it upon the bubo, and changing it at the end of three or four hours, by which time it becomes cool.

The application of collodion, which, by its power of contraction, exerts pressure upon the tumor, has been recommended by Dr. J. H. Clairborne and others.

Methods of Opening Buboes.—So soon as matter can be detected, and it is evident that resolution is impossible, the abscess should at once be opened. Delay will allow the pus to collect and undermine

[1] Traité des Maladies Vénériennes, p. 76.

the skin, which, becoming thin and deprived of its vascular supply, will be destroyed to a greater or less extent, thereby increasing the difficulty of cicatrization and adding to the dimensions of the unsightly scar.

The knife is in most cases preferable to caustic for this purpose. The extent and number of incisions to be made have been the subject of much discussion, and have called forth a great diversity of opinion. The chief question has been between a single free opening and a number of small punctures. The object proposed in these two methods is different. In the first, it is intended to transform the abscess into an open wound which will heal by granulation from the bottom; in the second, which is the less painful method, the design is to simply evacuate the contents of the swelling and secure adhesion of its walls, and thus expedite the cure and avoid the formation of a cicatrix. These latter results are indeed highly desirable provided they can be attained, but my own experience has led me in most cases to give a decided preference to the former course; since in numerous trials with multiple punctures, the matter, not finding free exit, has burrowed in various directions, and it has become necessary to resort to a free incision before cicatrization would take place.

My manner of proceeding is as follows. The hair should be thoroughly shaved from the surrounding parts to facilitate the after-dressing and promote cleanliness. If the patient be nervous, I administer ether so as thoroughly to explore the abscess without interruption. Entering the point of the knife at the most dependent part of the tumor, I carry the incision upwards parallel with the median line of the body to the full extent of the cavity. An incision in this direction is preferable to one in the course of the inguinal fold, since its edges are separated while those of the latter are approximated, by flexure of the thigh. Exposure to the air generally arrests the hemorrhage in a few moments, when I carefully examine the walls of the cavity for sinuses, and if any are found extending more than half an inch beneath the surface, I slit them up with a probe-pointed bistoury. Glands nearly isolated by the suppuration of the surrounding cellular tissue, and attached only by a small base or pedicle, are often found projecting into the cavity; and having been taught by experience that the wound does not commonly heal until these are cast off by a slow process of ulceration, I remove them with scissors or tear them out with the fingers when this can be done without much violence. Or, again when they have been large and sessile, I have passed a double ligature through their base,

and tying the two halves in opposite directions, have allowed the included portion to slough off. If left, their dark sloughy surface is perceptible for a long time, and they doubtless prolong the process of cicatrization. Any fistulous tracks which may exist at the time of opening the bubo, or which may subsequently form, should be fully laid open throughout their whole extent.

The hemorrhage from this operation is seldom so severe that it may not be arrested by exposure to the air, by ice, or pressure; but should it be profuse, or continued even in a small quantity, the bleeding vessel must be secured. I once saw a patient in whom a bubo had been opened, and who was completely blanched by a slight oozing of blood which had been allowed to go on for a number of days, beneath the coagulum which formed upon the surface.

Scraped lint, either dry or moistened in a mixture of laudanum and water, is now introduced into every recess of the cavity, paying particular attention to any short sinuses which it was not thought necessary to lay open with the knife, and a poultice or water-dressing applied. The pain and difficulty of motion which probably diminished on the first formation of matter, again increase for a few days, but are not severe if the patient keep quiet on his back. The first dressing, which becomes glued to the wound by coagulated blood, is loosened about the third day by the free secretion of matter, and should be removed, having first applied a hot poultice for a few hours. The subsequent dressings may consist of lint smeared with simple or medicated cerate, or moistened with any of the lotions recommended in the treatment of chancroids (as nitric acid and water, aromatic wine, Labarraque's solution, or the potassio-tartrate of iron), and will require to be changed twice a day. The cavity should from time to time be examined, and any burrowing sinuses that may be found be slit up with the knife; those of small extent, however, may be made to close by filling them carefully with lint at each dressing. The rapidity with which the wound contracts by granulations from the bottom and the approximation of its sides, is often astonishing, and but from two to four weeks are generally required for complete cicatrization to take place, during which time it is desirable that the patient should be confined to his room.

But though I cannot subscribe to the high encomiums bestowed upon multiple incisions, and think that they are inapplicable to the treatment of most buboes, yet I believe that they may be used with advantage in a few cases in which the abscess is superficial, and the skin over a considerable surface so thin and of such low vitality that a free incision would probably result in its total disorganization.

In such instances, a number of punctures with a bistoury or a grooved needle may be made around the margin of the tumor (as recommended by Vidal) rather than towards its centre, and the contents be allowed to drain away. Continued pressure should be applied after the lapse of twenty-four hours by means of compresses and a spica bandage, in order to prevent any farther collection of matter and secure adhesion of the walls. Even when these objects are not attained, the abscess will have time to contract, and a subsequent free incision may, if necessary, be made with less destruction of the integument.

Langston Parker's favorite treatment is as follows: "When a bubo is ready to be opened, we should not suffer the skin to become too thin, but make several very small punctures over its thinnest part with a grooved needle, perhaps six, eight, or ten; through these the matter will ooze out till the cavity of the abscess is empty. Through one of the punctures the point of a very small glass syringe may be introduced, and a very weak solution of the sulphate of zinc injected, in the proportion of two or three grains to the half-pint of water. When the abscess is quite empty, place over it a large compress of lint, and use moderately tight pressure by means of a roller. In many instances, if we can keep the patient quiet for twenty-four hours, we get either partial or total adhesion of the sides of the bubo, and a speedy cure will be the result; in other instances this may not be the case, but by the daily use of the injection through one of the punctures, which should be kept open for that purpose, we succeed in a few days, in almost every case, in effecting a cure."[1] I wish that I were able to confirm the above praise of this method to its full extent.

Roux (de Toulon) and Marchal (de Calvi) have proposed to inject buboes immediately after opening them with a mixture of one part of tincture of iodine to three or four of water. Langston Parker sometimes employs a solution of iodine and iodide of potassium, as follows:—

℞. Iodinii gr. iv.
Potassii iodidi gr. viij.
Aquæ ℥viij.
M.

A filiform seton recommended by Bonnafont, and also by Mr. Parker, was reported against by a committee of the Soc. de Méd. de Paris, in 1859.

[1] The Modern Treatment of Syphilitic Diseases, Phil., 1854, p. 148.

The use of caustics in opening buboes has been advised by several authors, but finds few advocates at the present day.

The method of MM. Malapert[1] and Reynaud,[2] which acquired some notoriety for a time, and was extensively used at the Emigrants' Hospital, Deer Island, Boston, when I was a student of medicine, consists in the application of a blister over the tumor, and of a pledget of lint soaked in a solution of corrosive sublimate (gr. xv to ℥j of water) to the vesicated surface previously freed from all secretion of serum. The caustic is allowed to remain for two hours, or until a superficial eschar is formed, when a large poultice is applied. The authors of this method claim that as the eschar is detached, the contents of the abscess ooze out through minute openings in the integument, the whole substance of which is not destroyed, and that the walls of the cavity are so stimulated and modified by the caustic that they rapidly contract and adhere. As stated upon a previous page, this method, although designed by its authors solely for the treatment of buboes after suppuration has taken place, has been applied by others for the purpose of effecting resolution. The excessive pain attending the application is not counterbalanced by any advantage over milder methods.

Treatment of Difficult Cases.—Unfortunately all buboes do not heal so readily as the reader might infer from the preceding remarks, which are intended to apply to the more favorable cases constituting doubtless the majority. Persistent buboes may be divided into two classes: 1st. Virulent buboes which take on phagedenic action and pursue a course similar to phagedenic chancroids upon the genitals, and which may extend to a considerable distance beyond the inguinal region, giving rise to large open sores; and, 2d. Those which are maintained, not by the presence of the chancroidal virus as in the former class, but by some morbid diathesis or general cachexia, and which are generally limited to the groin, where they burrow in various directions beneath the surface, without causing extensive ulceration of the integument.

The treatment of buboes belonging to the first class is the same as that of the phagedenic chancroid, for which I would refer the reader to a preceding chapter. At present I would simply recall to mind the danger of the internal use of mercury or its topical application to the sore in the form of ointment, etc., and to the benefit to be derived from nourishing diet, fresh air, tonics (especially the potassio-tartrate of iron), and opium internally; and locally from

[1] Arch. Gén de Méd., March, 1832.

[2] Traité des Maladies Vénériennes, p. 70.

cleanliness, deep cauterization with nitric acid, Vienna paste, or the actual cautery, and suitable lotions and dressings.

Cases belonging to the second class are met with in persons in whom the glandular swelling has been allowed to go on unchecked, or whose general condition or neglect to comply with the surgeon's directions has rendered treatment of no avail; and they are especially frequent in patients of a strumous habit and in those who have been debilitated by intemperance, an irregular course of life, antecedent diseases, want, or other causes.

To this class belong most of the so-called "constitutional buboes," occurring in persons who are really laboring under syphilis, but which are not, strictly speaking, to be regarded as syphilitic symptoms, since syphilis has merely acted like any other depressing influence in predisposing to a low form of inflammation and suppuration. Instances of this kind are frequent; advice is sought by a patient who evidently has syphilis and who has perhaps arrived at the tertiary stage; his general condition is very low; he complains of nocturnal pains, and exhibits a patch of rupia upon the arm, and also a large, oval, firm and projecting tumor in one or both groins; its longer diameter corresponding to the inguinal fold, its surface studded here and there with fistulous openings, and presenting at some distance soft or fluctuating points, pressure upon which forces from the mouths of the connecting sinuses a small quantity of thin, sero-purulent fluid—symptoms, in short, of the indolent bubo, above described; the surgeon is at first disposed to look upon the case as one of the exceptions to the rule that syphilis does not follow an open bubo, but he finds on inquiry that the glandular tumor is of a much later date than the constitutional disease; that it followed a chancroid or excessive sexual indulgence, or arose without any apparent exciting cause, and that it has clearly no direct connection with the original chancre. Has the reader never observed a very similar condition in the axillæ of poor, half-starved, and overworked washerwomen, in whom there could be no suspicion of syphilis?

Whatever the depressing cause may be, it should if possible be removed and the system be brought into a better condition before benefit can be expected from local treatment. Favorable hygienic influences, a simple but nourishing diet, and tonics are required in all cases; and, in strumous subjects, iodine, the iodides of potassium and iron, and cod-liver oil. Recollect that the presence of a bubo by no means proves that the patient has syphilis, the existence of which should not be admitted until after the most careful and

thorough examination. Should this fact be clearly established, specific remedies will sooner or later be required. If the constitutional disease be in the tertiary stage, iodide of potassium may be freely given and will prove the best tonic that can be found; but mercury should be administered with great caution and combined with quinine or iron, or be altogether deferred until the general health has been improved by the means above indicated. No course of treatment which adds to the existing depression of the system will benefit the local affection.

As the patient's health improves, the bubo generally assumes a more favorable aspect, and if it does not entirely heal will yield to remedies which were before powerless. When the sinuses are not too deep or extensive, they should be slit up and dressed from the bottom with lint, or their walls be pencilled with a crayon of nitrate of silver. When this course is inadmissible, I believe that the best results are obtained from injecting them with diluted tincture of iodine every few days, and applying pressure over the tumor by means of compressed sponge and a roller, or with Ricord's pad. Under one or the other of these methods they will rarely fail to cicatrize. In desperate cases, Ricord resorts to the destruction of the diseased ganglia by Vienna paste, in the following manner: "This caustic is applied over an extent of two-thirds of the tumor, so as to destroy the cutaneous surface, then on the fall of the eschar, which is hastened by basilicon ointment and other digestives the ganglia are attacked layer by layer; increasing our caution as we proceed in depth, and stopping within accessible limits, or when we approach the neighborhood of vital parts. This method is generally very rapid, and the deep ganglia undergo resolution as the superficial ones are destroyed."[1]

[1] Notes to Hunter, 2d ed., p. 390.

CHAPTER VI.

LYMPHANGITIS.

HAVING described the inflammation of the ganglia which constitutes a bubo, it will be necessary to devote but a few words to the consideration of lymphangitis; since the phenomena are almost identical in the two cases; the latter being in fact a bubo seated in the course of a lymphatic vessel instead of in the terminal ganglion.

As a general rule, morbid products which undergo absorption do not manifest their presence in the lymphatics themselves, probably in consequence of the rapidity of their passage; and the changes which take place in the ganglia where their progress is impeded, are the only indication that this system of vessels is affected. In conformity with this law, the lymphatics which convey the pus from a chancroid in the direction of the ganglion generally escape, but in some instances inoculation takes place at one or more points in the course of the vessel and virulent lymphangitis is set up.

Virulent lymphangitis most frequently accompanies a chancroid of the prepuce. A hard, uneven chord is observed running along the dorsum of the penis towards the mons veneris in which it is usually lost. This chord is made up in part of the thickened and distended walls of the lymphatic vessel, but in part also of the infiltrated cellular tissue in its neighborhood. The dorsal vein and artery are usually included in the inflammatory engorgement and cannot be isolated from the vessel. Considerable heat and pain are experienced, and the course of the inflamed vessel is marked by a red line upon the surface. As we shall see hereafter, these symptoms of acute inflammation are sufficient to distinguish lymphangitis from the induration of the lymphatics which often accompanies a chancre.

Virulent lymphangitis, like a virulent bubo, necessarily terminates in suppuration; abscesses form at one or more points in the course of the vessel, and, when opened, present the usual symptoms

of chancroids, and require the same treatment. A gland in the groin may, or may not be similarly affected at the same time.

The symptoms of simple lymphangitis which may also attend the chancroid as well as a gonorrhœa, do not vary from the above, except that resolution is possible, and if suppuration take place the pus is not inoculable.

PART III.

SYPHILIS.

CHAPTER I.

INTRODUCTORY REMARKS.

SYPHILIS is one of the class of diseases called "infectious," the characteristics of which are the following:—

1. The presence of a morbid poison or virus, which transmits the disease from one individual to another.
2. The immunity which one attack generally confers against a second.
3. A "period of incubation," during which the virus is latent and gives no external manifestation of its presence in the system.
4. A degree of order and regularity in the evolution of the symptoms.

SYPHILITIC VIRUS.—The existence of a syphilitic virus has sometimes been called in question,[1] but at the present day is established beyond a doubt. The daily experience of every surgeon demonstrates that in syphilis there exists a contagious element, by means of which the disease is communicated; and though this morbid poison has never been detected by the senses, the microscope, or chemical analysis, its presence is fully proved by its effects. Various theories have been offered to explain its nature, but they have all been either fanciful or untenable, and their authors have invariably confounded the syphilitic with the chancroidal virus.

[1] Chiefly by the following authors: BRU, Méthode Nouvelle de traiter les Maladies Vénériennes par les gâteaux toniques mercuriels, t. i., chap. 3, p. 45. Paris, 1789. CARON, Nouvelle Doctrine des Maladies Vénériennes. Paris, 1811, p. 33. RICHOND DES BRUS, De la Non-existence du Virus Vénérien. Paris, 1826, t. i., p. 76. JOURDAN Traité complet des Maladies Vénériennes, t. i., p. 388.

Thus the essential element of this disease has always remained concealed, and probably always will, until our knowledge in general of the principle of life and the nature of disease is very much greater than now.

The severity of the symptoms produced by syphilis on its first appearance in the latter part of the fifteenth century, compared with its greater benignity at the present day, affords some ground for believing that its virus is slowly but gradually losing in intensity in the same manner as the vaccine virus becomes weaker after many successive removes from the cow. This fact was noticed by Astruc[1] in the middle of the last century, who says: "Whatever might formerly be the power and efficacy of the venereal disease when it was new and in vigor, while the undivided poison violently effervesced. there is nothing like it, I imagine, to be feared from it now, as it is weakened, becomes old, and its force almost quite spent." Another explanation advanced by some writers is, that the syphilitic virus retains its power, but that a preservative influence is transmitted to posterity by those who have the disease, which, like some vegetables, gradually exhausts the soil from which it springs of the materials necessary to its support. Admitting the fact, the first mentioned theory is probably the correct one.

SYPHILIS COMMONLY OCCURS BUT ONCE IN THE SAME PERSON.—It is true of all diseases which are both contagious and constitutional, that a person who has once had them is indisposed to contract them again. Smallpox, scarlet fever, measles, the hooping cough, and vaccine disease, all follow this law; and in the rare exceptions which sometimes occur, the symptoms are generally so modified as still to evince the protecting influence of the first attack. The applicability of this law to syphilis was first announced by Ricord in 1839, and, in spite of frequent denials, may now be regarded as unquestionable. The immunity conferred by an attack of syphilis is as great as that resulting from an attack of any of the other infectious diseases just mentioned.

Without due care, however, it is an easy matter to be deceived on this point. After syphilitic infection, but few persons escape with only one outbreak of general symptoms; however thorough their treatment may have been, one or more relapses usually occur, and if one of these has been preceded by a newly caught venereal ulcer the secondary symptoms which follow are frequently ascribed to its

[1] English translation of Astruc, London, 1754, p. 102.

influence, especially if the ulcer happened to be situated upon the remaining induration of the first, and thus similated a chancre. Fortunately, we are able in most instances to recognize a recent attack of syphilis by the following signs, and in their absence to ascribe the symptoms to an old infection:—

1. By the induration of the preceding chancre and neighboring lymphatic ganglia.

2. By the time elapsing between the appearance of the suspicious ulcer and that of the general symptoms; the interval, in the absence of treatment, and when the latter are dependent upon the same infection as the former, being very uniformly about six weeks, and rarely exceeding three months.

3. By the character of the symptoms; whether belonging to an early or late stage of syphilis.

4. In some cases, by the influence of treatment; the early symptoms of general syphilis yielding most readily to mercury; the later to iodide of potassium.

But are there no exceptions to the law of the "unicity of syphilis," such as undoubtedly exist in respect to other infectious diseases? Numerous instances are recorded in which small-pox, scarlet fever, the measles, and hooping cough have occurred twice in the same person. A single vaccination does not always protect one through life from variola. A second inoculation with the vaccine virus performed in adult life will often succeed nearly if not quite as well as the first vaccination performed in childhood. In the case of a second infection from any of the diseases mentioned, the severity of the attack will, as a general but not invariable rule, be in inverse ratio to the length of time which has elapsed since the previous infection. In other words, the protecting influence of the virus appears to gradually diminish and finally disappear. One attack confers complete immunity for a time; then comes a period in which inoculation (as of the variolous or vaccine poisons) will produce a local effect without general reaction; and finally a third period in which constitutional manifestations of greater or less intensity are possible.

As early as 1845, Ricord himself expressed the belief that similar exceptions to the law of the unicity of syphilis would also be found to exist; he trusted it was so, since it would prove that the effect of syphilis was not necessarily life-long; at the same time he confessed he had never as yet met with an unquestionable instance.

Within the last few years, attention has been directed anew to this subject. Scattered cases of repeated syphilitic infection in the

same person have been reported by various observers, and Ricord himself has met with two which he regards as conclusive. By far the most valuable contribution, however, to our knowledge of syphilitic reinfection has recently appeared from the pen of Diday,[1] who has been fortunate enough to meet with over twenty cases, and who is the only syphilographer who has carefully studied the phenomena resulting from a second inoculation. The conclusions at which he has arrived and which are entitled to the highest consideration are the following:

1. As a general rule, the syphilitic, like other kinds of virus, does not exercise the same action twice in succession upon the same individual.

2. When applied (under such conditions as to permit absorption) to a syphilitic subject, this virus produces no effect; applied to a subject who has had, but who no longer has syphilis, it produces a modified form of syphilis.

3. The more feeble the first attack, and the longer the time that has since elapsed, the more energetic will be the action of the virus and the more severe will be the second attack of syphilis; and *vice versâ*.

4. Experience shows that the only persons upon whom a second introduction of the syphilitic virus produces a pathological effect are those who are cured of their first attack, or who at least have no other symptoms than those which cannot be transmitted either by generation or by contact (tertiary symptoms).

5. The effects of the second introduction of the virus, under the conditions just mentioned, have presented in twenty-five cases which have been observed, the following varieties:—

A. In fourteen, there has been an ulcer presenting all the characteristics of an indurated chancre, *except concomitant induration of the ganglia*, and this ulcer has not been followed by general symptoms. Thus the absence of glandular induration may enable the surgeon to recognize in advance those indurated chancres which will not be followed by general symptoms.

B. In nine cases, there was an indurated chancre followed by general symptoms, which were less intense than those of the first attack.

C. In two cases, there was an indurated chancre followed by general symptoms of greater intensity than in the first attack.

[1] De la Réinfection Syphilitique, de ses Degrés et de ses Modes Divers, Arch. Gén. de Méd., Juillet et Août, 1863.

6. If we compare the intervals of time elapsing between the two attacks in these different series of cases, we find that the shorter the interval the more feeble was the effect of the second infection; the interval being at a minimum when the second attack produced only a chancre, and at a maximum when the general symptoms of the second attack were more intense than those of the first.

No less than twenty of the cases above referred to were observed by Diday in his private practice within a period of six years, and he therefore infers that instances of syphilitic reinoculation are more frequent than has generally been admitted, although they are rare when compared with the whole number of cases of syphilis that occur. This surgeon draws the following conclusions from a consideration of this subject:—

The reinfection of a man who has had syphilis proves that he was cured of it at the time of the second infection.

The possibility of reinfection proves that syphilis can be radically cured—a fact denied by many authors, who admit only a cure of syphilitic manifestations, and who maintain that the constitutional poisoning (or *diathesis*, as they erroneously call *syphilitic intoxication*) is perpetual.

The average time necessary for a radical cure may be deduced from the cases above referred to, and which give a minimum of twenty-two months.

Finally, in any case of reinfection from syphilis, the surgeon should always wait for general symptoms to appear before giving mercury, since in the majority of cases the effect is limited to the production of a chancre, and specific treatment is not required.

SYPHILIS POSSESSES A PERIOD OF INCUBATION.—By a period of incubation we understand the lapse of time following the introduction of a morbid poison into the system, and preceding the earliest manifestation of its presence. Thus a person is exposed to small-pox, the measles or scarlatina, and when contagion takes place, breaks out with the symptoms of the disease only after an interval, which, with slight variation, is constant in each of the affections mentioned, and during which he enjoys his usual state of health. That syphilis possesses such a period of incubation will be shown when treating of its initial lesion, or the chancre so-called. Again, in a subsequent chapter, the reader will find that the general manifestations of syphilis are also preceded by a period of quiescence of the virus, following the appearance of the chancre.

THE ORDER OF EVOLUTION OF SYPHILITIC SYMPTOMS AND THE CLASSIFICATION FOUNDED THEREON.—The classification of syphilitic manifestations in common use is founded chiefly upon the order of their evolution, and embraces "primary," "secondary," and "tertiary symptoms." Primary symptoms should include the initial lesion which appears at the point where the virus enters the economy, and the induration of the neighboring lymphatic ganglia. Next follows, after a period of incubation, another set of symptoms, called "general," because they are developed at points distant from the seat of the initial lesion, to which they stand in no necessary anatomical relation.

Ricord's classification of general symptoms into *secondary* and *tertiary*, which is generally adopted at the present day, is founded upon Hunter's division of the tissues affected by syphilis into "parts first in order, and parts second in order." Both systems are based upon the conformity of nature to laws which are more or less fixed as well in disease as in health, and upon the anatomical structure of the parts affected. An important distinction, also, which Ricord claims to exist between the two divisions in this classification, is a difference in the effect of remedies; secondary symptoms being more susceptible to mercury, and tertiary to iodine and its compounds.

Ricord's classification may best be given in his own words: "Secondary symptoms are the consequence of the absorption of the virus, and are transmissible by hereditary descent, without being inoculable. Tertiary symptoms are not only not inoculable, but cannot be transmitted by hereditary descent under their pecular type, although in consequence of a kind of degeneration or modification of the syphilitic virus, they are probably one of the most fruitful sources of scrofula.

"Secondary symptoms rarely occur before the third week following the appearance of primary symptoms, and more rarely still after the sixth month; whilst tertiary symptoms scarcely ever appear before the sixth month, and may not until after several years.

"To secondary symptoms are referred certain affections of the skin (syphilitic eruptions) and of some parts of the mucous membranes (mucous patches, condylomata and superficial ulcerations) and their dependencies (alopecia and onyxis); also some peculiar pathological affections of the eyes (iritis), lymphatic ganglia (engorgement of the glands in various parts of the body, especially the neck), etc. Tertiary symptoms consist of certain changes which take place in the subcutaneous or submucous cellular tissue (gummy

tumors), in the testicles (orchitis), in the fibrous and osseous tissues (periostitis, ostitis, caries, etc.), and in the deeper organs.

"Proper treatment of the primary symptom may prevent the development of secondary symptoms. Very often this treatment cures the primary and arrests only the secondary symptoms; in this way may be explained, for example, the late appearance of diseases of the periosteum and bones, without the secondary link, in persons who have taken mercury. When once the primary ulcer is healed, it cannot be reproduced except by a new contagion; while secondary and tertiary symptoms may appear repeatedly, and at various intervals, within periods which cannot be limited. An apparent inversion in the succession of secondary and tertiary symptoms is observed only in persons who have undergone treatment. After the appearance of constitutional symptoms, the *syphilitic diathesis* may cease spontaneously or in consequence of appropriate treatment, and yet the symptoms persist under the influence of purely local causes, as is observed especially in many cases of diseased bones."[1]

In another place Ricord says of tertiary symptoms: "They not only differ from primary and secondary symptoms in affecting the deeper tissues, but also in the fact that in them syphilis loses, in part, its peculiar type. Though the skin is often affected at this period with the most severe tubercular eruptions, yet the subcutaneous and submucous cellular tissues, and the fibrous and osseous systems are far more frequently involved. But, in addition to these parts, where the tardy effects of constitutional syphilis are so common and clearly admitted by all good observers, we may well inquire whether there be any privileged tissues of the body which are invariably exempt from its effects. We would inquire, also, if syphilitic infection, though it may not produce all the evils with which it is reproached, be not in a multitude of cases the cause of the evolution, or 'putting into action'—to use an expression of Hunter's—of diseases which have previously existed in a latent state, and of which it is thus only the exciting cause. Observation replies in the affirmative to these questions, and also teaches us that tertiary symptoms may continue under the influence of the virulent cause, or persist as local effects after this cause has been destroyed or neutralized by treatment; it shows, in a multitude of cases, that the syphilitic virus, after having been the cause of other diseases, may cease to exist or persist as a complication; and these are circumstances which, though real, are unfortunately not always easily appreciated.

[1] Notes to Hunter, p. 396.

"Tertiary symptoms rarely occur before the sixth month following the appearance of the primary ulcer, and the latter seldom remains at the time of their development; but they are frequently attended by some secondary symptom. They never furnish inoculable secretions, nor transmit characteristic constitutional syphilis from parent to child; their only hereditary influence being the frequent transmission of a taint as injurious and almost as fearful, viz., a scrofulous diathesis."

Ricord's classification may, I think, be resolved into two parts. The first is the chronological system, which, originating with Fernel and Hunter, has been freed from many errors by Ricord, and greatly perfected by this surgeon's keen powers of observation, and which is both natural and eminently practical. The second part consists of various additions relative to the inoculability of the different orders of symptoms, their transmission by hereditary descent, and the effect of treatment; some of which are open to criticism. I shall speak of each in turn.

The general symptoms of syphilis are not drawn at hap-hazard, but make their appearance with a great degree of order and regularity. This fact is most apparent in those lesions which follow immediately upon the period of incubation, and which vary but little in different subjects. Allow any patient with a chancre to go without treatment, and it may be predicted with almost absolute certainty, that within three months he or she will be attacked by the following category of symptoms with but little variation, viz., general lassitude, accompanied by headache and fleeting pains in various parts of the body; alopecia; an eruption of blotches or papulæ upon the skin; pustules upon the hairy scalp; engorgement of the post-cervical glands; and whitish patches, which may become ulcerated, upon the mucous membrane of the mouth, anus, or vulva.

Subsequent to the first outbreak of general syphilis, the same uniformity does not prevail; and certain symptoms are absent in one case and present in another, or they appear to be modified by the constitution of the patient, the hygienic conditions in which he is placed, his habits, and especially by treatment. But if we take a number of cases, some of which supply what is wanting in others, we find that we can, as it were, make up a complete series in which the symptoms progress by a regular gradation, and may be divided into two classes, distinguishable by the time of their appearance, their character, and their seat. Those of the first class follow immediately upon the earliest general symptoms before men-

tioned, with which they are evidently identical in character. Those of the second class never occur until after a certain interval which experience enables us to determine with great precision. Again, the order of the two classes is never reversed, For instance, a patient who has been suffering with symptoms belonging to the second, as deep tubercles of the cellular tissue or caries of the bones, is never known to exhibit the premonitory fever, exanthematous eruption, and other early symptoms of the first. The disease progresses with greater rapidity in some cases than in others, yet owing to the general uniformity referred to, simple inspection of a patient will enable any one familiar with its natural course to arrive at an approximate conclusion as to the length of time that has elapsed since contagion, and also as to the character of the preceding symptoms, unless these have been altogether suppressed by treatment.

Apparent exceptions to the regular succession of the general symptoms of syphilis are met with, and may readily deceive an inexperienced observer. One of the most frequent of these is due to treatment. It often happens that a patient had a chancre many years ago, and perhaps early secondary symptoms, for one or both of which he took mercurials; a long period has since passed without further general manifestations; but his system has continued under the influence of syphilis, which finally becomes active again and gives rise to tertiary lesions. Evidently the exemption from late secondary symptoms may be ascribed to mercury.

Again, the date of the first appearance of any lesion determines its position in the syphilitic scale; while its persistency may be due to many causes, too numerous to mention. It is a very common occurrence for a chancre to remain until secondary symptoms break out; but we do not therefore conclude that both belong to the same order. In the same way, secondary are often present long after tertiary manifestations have supervened. In Ricord's admirable remarks already quoted, allusion has been made to the fact which I have often had occasion to verify, that syphilis may give rise to symptoms, which are continued by various causes and especially by a strumous diathesis, long after the exciting cause has been subdued. Moreover, many syphilitic lesions, and particularly eruptions upon the skin and mucous membranes, may, either with or without treatment, disappear, and again return within a limited period with the same characters as at first. This tendency, however, ceases with time; and relapses after a considerable interval are in all cases rare. For instance, syphilitic erythema, which usually appears about the sixth week after the development of the chancre,

may perhaps return as late as the eighth or ninth month, but never several years after the chancre.

Finally, the same name is, in several instances, applied to symptoms which are in reality distinct, and which are widely separated upon the syphilitic scale. Thus there is a form of alopecia which is one of the earliest general symptoms, and in which the hair is freely shed from the scalp and eyebrows, but may grow again, since the hair-bulbs are not seriously affected; and there is another and rarer form, observed only in the later stages of syphilis, in which the whole integumental surface becomes permanently bald. Two forms of iritis, ecthyma, etc., are also observed at distinct periods; but these constitute no exception to the law of succession of syphilitic symptoms.

We thus see that a simple chronological division of constitutional symptoms may be maintained; but there are several objections to the additions made to this system by Ricord, as I shall proceed to show.

In the first place, Ricord's statement that "secondary symptoms are not capable of inoculation," is true in the guarded sense in which it was intended, viz., that they are not inoculable upon the persons bearing them; but the inference which was also designed to be conveyed, that they differ in this respect from a chancre, is not true, as Ricord himself has since acknowledged. Both are contagious and inoculable upon persons free from syphilitic taint, but neither are auto-inoculable.

Again, Ricord's statements relative to tertiary symptoms cannot at the present day be implicitly received. This author maintains that tertiary lesions are not inoculable and cannot be transmitted by hereditary descent under their peculiar type, and hence that the virus in this stage must be entirely changed from its original character. The first of the above assertions is doubtful, the second incorrect. The inoculability of tertiary symptoms has never been tested upon persons free from syphilitic taint, and its possibility, therefore, may yet be demonstrated, as that of secondary symptoms has been. Their transmission by hereditary descent in a few instances, still preserving their peculiar type, is a known fact. The most frequent instance of this is the occurrence of syphilitic hepatitis and deep tubercles of the subcutaneous cellular tissue in infants affected with hereditary syphilis. Virchow[1] has also found small

[1] La Syphilis Constitutionnelle, traduit de l'Allemand par le Dr. Picard, Paris, 1860, p. 4.

collections of the deposit peculiar to tertiary syphilis in the cerebral substance of children born of syphilitic mothers.

Hunter attributed the difference in the situation of early and late general symptoms to the influence of cold, which, as he supposed, rendered the more superficial parts of the body most susceptible to, and earliest affected by the virus. This anatomical distinction, without Hunter's explanation, has been retained in Ricord's classification, in which the skin and mucous membranes on the one hand, and the osseous, fibrous, and cellular tissues on the other, are regarded as the exclusive seat of secondary and tertiary manifestations respectively. But this rule cannot always be maintained, since one of the earliest symptoms of general syphilis—preceding in many cases the eruption upon the skin—consists of pains resembling rheumatism, some of which are evidently seated in the periosteum (chiefly that of the cranium and in the neighborhood of the joints), and this fibrous tissue has been known to take on acute inflammatory action at this time. In order to avoid this difficulty, Bassereau asserts that general syphilis attacks indifferently the integumental, fibrous, and osseous structures in all periods of the disease, but that the more superficial portions of each are affected in the earlier and the deeper in the later stages.

Virchow[1] would exclude all consideration of situation from the classification of general symptoms, and has proposed a system based upon the nature of the pathological changes in the different lesions. but which is too widely at variance with the ideas at present received to meet with general adoption. Von Baerensprung[2] offers a similar classification in which secondary symptoms are made to include those lesions which are characterized by hyperæmia and simple exudation; and tertiary symptoms those in which there is tubercular deposit.

But it is easier to pull down than it is to build up, and attempts in the latter direction may well be deferred until many preliminary points are settled. Meanwhile, we have every reason to be satisfied with the simple and natural chronological division which forms the basis of Ricord's classification, and which owes its excellence in a great measure to the keen powers of observation of this truly eminent surgeon. The few errors which he introduced are not essential to the system, and may well be forgotten, when we recollect his important contributions to our knowledge of the natural history of syphilis.

[1] Op. cit.

[2] Annales de la Charité, vi., p. 56, et vii., p. 178.

The time of the appearance of any given syphilitic lesion will be influenced in a measure by the constitution of the patient, his mode of life, and the treatment to which he is or has been subjected, and can therefore be determined only approximatively. The following table compiled by M. Martin[1] from the statistics of McCarthy, Bassereau, Sigmund, and Fournier, is, however, of value in exhibiting the usual period of development, following the appearance of the chancre, of the more important syphilitic symptoms:—

SYMPTOMS.	Date of usual development.	Date of earliest development.	Date of latest development.
Roseola,	45th day.	25th day	12th month.
Papular eruption,	65th "	28th "	12th "
Mucous patches,	70th "	30th "	18th "
Secondary affections of the fauces,	70th "	50th "	18th "
Vesicular eruption,	90th "	55th "	6th "
Pustular eruption,	80th "	45th "	4 years.
Rupia,	2 years.	7th month.	4 "
Iritis,	6th month.	60th day.	13th month
Syphilitic sarcocele,	12th "	6th month.	34th "
Periostosis,	6th "	4th "	2 years.
Tubercular eruption,	3 to 5 years.	3 years.	20 "
Serpiginous eruption,	3 to 5 "	3 "	20 "
Gummy tumors,	4 to 6 "	4 "	15 "
Onychia,	4 to 6 "	3 "	22 "
True exostosis,	4 to 6 "	2 "	20 "
Ostitis, changes in the bones and cartilages,	3 to 4 "	2 "	41 "
Perforation or destruction of the velum palati,	3 to 4 "	2 "	20 "

In most cases, when syphilis is abandoned to its natural course uninfluenced by treatment, the earliest general symptoms nearly or quite disappear spontaneously, and, after a time, are succeeded by another set, which, in its turn, may give place to a third, and so on; the number of successive outbreaks varying in different cases, and commonly being in proportion to the intensity of the action of the virus. Thus syphilis usually shows itself not in a continuous, but in an interrupted succession of symptoms,—a fact of some importance, because too often the reappearance of syphilitic manifestations is regarded as a relapse, while it is really but the natural course of the disease.

In the majority of cases, even in the absence of treatment, syphilis tends to self-limitation, and its symptoms ultimately cease to appear, leaving the patient in a fair state of health.

For the demonstration of these two facts in the natural history of syphilis, we are chiefly indebted to Diday.[2]

[1] De l'Accident Primitif de la Syphilis Constitutionnelle, Paris, 1863, p. 87.

[2] Histoire Naturelle de la Syphilis.

CHAPTER II.

THE INITIAL LESION OF SYPHILIS, OR CHANCRE.

As stated in the introduction to the present work, logical accuracy as well as simplicity and perspicuity of language require the abandonment of the terms "hard," "indurated," and "infecting chancre," as applied to the initial lesion of syphilis, which should be called simply by the name of *chancre*, or *primary syphilitic ulcer*. If the name of "Hunterian chancre" be retained, it should be applied exclusively to the less frequent form of chancre which Hunter designated, and which is characterized, in addition to the induration common to all forms of chancre, by a degree of ulceration that involves the whole thickness of the skin or mucous membrane. The term "infecting chancre" is especially objectionable, as it implies that it is the chancre which infects, whereas the very development of this sore is the *result* of constitutional infection. As Diday remarks, when a man contracts syphilis, the only chancre that can properly be called infecting is the one upon the woman who gave him the disease.

For a comparison of the frequency of the initial lesion of syphilis with that of the chancroid, the reader is referred to the first chapter of the second part of this work, where the remarks upon the seat of the chancroid are also applicable in the main to the sore under consideration. The following table exhibits the seat of 470 chancres, comprising all that were observed at the Hôpital du Midi, in the year 1856.

Chancres on the glans and prepuce	314
" on the skin of the penis	60
" on various parts of the penis	11
" involving the meatus	32
" within the urethra (not visible on forced separation of the lips of the meatus, but recognized by palpation, inflammation of the lymphatics, etc.)	17
" on the scrotum and peno-scrotal angle	11
" of the anus	9
" " lips	12

Chancres of the tongue			8
"	"	nose	1
"	"	pituitary membrane	1
"	"	fingers	1
"	"	leg	1
		Total	470

By comparing this table with the one upon page 336, it is seen that the seat of chancres is still more extensive than that of the chancroid, since it embraces the face and buccal cavity where the last mentioned ulcer is rarely, if ever, met with in practice, but where the syphilitic virus is often inoculated from a secondary lesion in the contact of mouth with mouth, etc.

Has the chancre a period of incubation? This is an important question, since it involves two others of great practical interest: 1. Whether the chancre is a local or constitutional lesion. 2. Whether its abortive treatment can prevent systemic infection. The solution of this question by experimentation is impracticable, since inoculation of a chancre upon persons already infected is in most cases impossible, and upon healthy individuals unjustifiable. We can, therefore, refer only to clinical observation, and, even here, no slight difficulty is encountered. Patients may not come under observation until some days or weeks after contagion; they have often had sexual connection repeatedly at short intervals; and their statements as to the time of infection and the appearance of the chancre are not always reliable. But many careful observers have noticed the fact that, as a general rule, advice is sought at a later period for a chancre than for the chancroid, and the interval between contagion and the appearance of the ulcer is represented by patients as longer in the former than in the latter. Diday made minute inquiry of twenty-nine persons whose chancres were of recent origin; who appeared to be trustworthy, and certain of the facts which they stated; who had been exposed but once, and who had had no previous connection for at least a month, and found that the average interval between the sexual act and the appearance of the sore was fourteen days.[1] M. Chabalier, in an examination of ninety cases of chancre, found an average period of incubation of from fifteen to eighteen days; and states that the chancroid, on the contrary, is visible within thirty-six or forty-eight hours after contagion.[2] M. Clerc has especially insisted upon the presence of incubation as diagnostic of the chancre, and has reported several cases which

[1] Gaz. Méd. de Lyon, March 1, 1858.
[2] Thèse de Paris, No. 52, 1860, p. 111.

were preceded by a period of incubation of thirty days. I have myself met with very many cases in which the interval between a single exposure and the appearance of a chancre exceeded fourteen days, and in some there is every reason to believe that it has been of much longer duration. A gentleman of this city, of high social position, whom I know so intimately that I can vouch for the truth of his statements, visited Paris unaccompanied by his wife, and, while under the influence of wine, for the first time during fifteen years of married life had connection with a woman of the town. This was on the eve of his return to America, and his subsequent remorse and anxiety were so great that on his voyage home he examined himself daily with the greatest care to see if he had contracted any disease. His prepuce was very short, so that the glans was habitually uncovered and no lesion was likely to escape observation, yet he found nothing until the day of his arrival home, the thirty-fifth after exposure, when he noticed a slight excoriation upon the internal surface of the prepuce. He showed it to his family physician, a Homœopath, who told him that it was a mere abrasion which would heal in a few days, and that he might with safety have connection with his wife. As the promised cicatrization did not take place, on the fourth day after his arrival he applied to me, and I found a superficial chancre with well-marked parchment induration and attendant indurated ganglia. Since then he has had several attacks of general syphilis, and his wife, who was in the fifth month of pregnancy, contracted a chancre, had a syphilitic eruption, alopecia, iritis, etc., and gave birth to an infected child at term, which, under homœopathic treatment, died at the age of one month.

While writing these pages, my advice has been sought by a very intelligent physician, who was exposed but once to contagion on the night of August 16, and a well-marked chancre which he now bears upon the internal surface of the prepuce first appeared, September 1; making an interval of sixteen days. I have also at the present time under my care a merchant, who has been subject to herpes, and has been in the habit of watching his genital organs very closely after exposure. He now has a chancre, which he is positive did not show itself until five weeks after his last coitus.

Castelnau reports a case communicated to him by the physician of a venereal hospital, who was himself the subject of the observation, in which a chancre appeared thirty-three days after an impure intercourse.[1]

[1] Annales des Maladies de la Peau et de la Syphilis, t. i., p. 212.

But we have still more conclusive evidence of the incubation of the chancre in three cases in which the inoculated point was watched from day to day. The first is reported by Rollet. This surgeon, desirous of testing the character of a sore, inoculated its secretion without success upon the person bearing it. He then repeated the inoculation upon several persons who were affected with syphilis, and with the same negative result. This was previous to the discovery of the fact that the chancre is not auto-inoculable; hence Rollet believed it safe to inoculate the secretion of the same sore upon still another individual, who was free from syphilis, although affected with chancroids and a suppurating bubo. The inoculation proved successful, and gave rise to a chancre, which did not make its appearance until the eighteenth day.[1] In two other cases of artificial inoculation of a chancre, one performed by Rinecker and the other by Gibert, the period of incubation was 25 and 24 days respectively.

When speaking of the abortive treatment of chancres, I shall also adduce facts to show that destructive cauterization of a chancre, at a very early period of its existence, does not prevent secondary symptoms, and hence that the system must be regarded as infected from the first. Moreover, the analogy of other infectious diseases, as vaccinia, glanders, etc., leads us to infer that the absorption of the syphilitic virus is instantaneous.

In short, there can be no question at the present day that the initial lesion of syphilis, as of other infectious diseases, possesses a period of incubation. So far as we can now determine, this period is, upon an average, of from two to three weeks' duration, and may undoubtedly extend to five or even six weeks. To ascertain its shortest limit is attended with more difficulty, since the virus is sometimes deposited in a wound or abrasion occurring at the time of coitus, and, in consequence of inattention to cleanliness or other accidental causes, remaining open until the development of the chancre, so that it is impossible to say precisely when the simple is transferred into the specific ulcer. The inoculation of the same point with the chancroidal and syphilitic poison will also explain why in some instances the initial lesion of syphilis appears to be developed in some cases earlier than in others, since the action of the former virus commences at once and gives rise to an ulcer which may be perceived by the patient in the course of two or three days, and which masks the later development of the chancre.

The following table, prepared by M. Bassereau,[2] of the chancres

[1] Archives Gén. de Méd., Avril, 1859, p. 409.

[2] Op. cit., p. 140.

which preceded 170 cases of syphilitic erythema, will indicate the various forms which a chancre may assume, and afford some idea of the comparative frequency of these forms in the milder cases of the disease, of which the more severe instances exhibit a larger proportion of excavated ulcers:—

Superficial erosions	146
Circumscribed ulcers, with abrupt edges, involving the whole thickness of the skin or mucous membrane	14
Circumscribed phagedenic ulcers, with a pultaceous floor, involving the tissues a short distance beyond the skin or mucous membrane	10
Total	170

It appears from this table that the chancre has no exclusive form, but that it most frequently assumes one which differs widely from the chancre-type as heretofore described by most authors. The frequency of the superficial form of chancre excited my attention several years before I had met with any description of it in books, and the first cases which came under my notice were mistaken for mere abrasions until the appearance of secondary symptoms corrected the diagnosis. Within the last year, a physician, well instructed in the literature of venereal, applied to me with a superficial chancre so closely resembling a simple abrasion that I could not persuade him of its specific character, and therefore advised him to examine the woman with whom he had had connection and see if she did not present symptoms of syphilis. A few weeks after, they both called at my office; the physician, with syphilitic erythema; his mistress, with syphilitic papulæ.

The superficial form of chancre is most marked on the internal surface of the prepuce, by which it is protected from the air and friction, and kept free from scabs; and it is in this situation that I have most frequently met with it. It has generally a circular or ovoid, but sometimes irregular, outline. Its floor is but slightly, if at all, excavated, and occasionally is even elevated above the surrounding integument by the subjacent induration. Its surface is smooth, often looking as if polished, destitute of the consistent and adherent exudation of the chancroid, and of a red or grayish color. Its secretion is a clear serum — free from pus-globules, unless the sore has been irritated — which may often be seen issuing from minute pores, after the previous moisture has been wiped away. It has no surrounding areola, and leaves no cicatrix to mark its site Barely one-third of the chancres in Bassereau's 170 cases, left any visible trace aside from induration. When situated upon the ex-

ternal integument, as the sheath of the penis—where most venereal ulcers are chancres—and exposed to the air, it becomes covered with scabs, which give it the appearance of a pustule of ecthyma, or a patch of scaly eruption, and which may readily lead to an error in diagnosis. The characters of the chancrous erosion are also modified by the application of irritants, or by a want of cleanliness; its secretion may become purulent, and its surface resemble that of the chancroid; but its normal appearance may be restored by applying a water-dressing for a few days.

Frequent as is the chancrous erosion, it must not be regarded as the exclusive form of chancre. Diday believes that it is due to inoculation from a secondary, and that the excavated chancre is produced by inoculation from a primary lesion. Between this form and the indurated excavated ulcer, known as the Hunterian chancre —which was so long and so erroneously supposed to be the especial harbinger of general syphilis—there may exist many gradations which it is unnecessary to describe in detail. Ulcerative action may, though rarely, go beyond this point, and terminate in phagedena; but, generally, it is limited by the plastic inflammation of the surrounding tissues, as is evident from an examination of the edges of nearly all the forms of chancre, which are sloping, somewhat prominent, and adherent, unlike the abrupt and detached margins of the chancroid.

We have seen that inoculation of the secretion of the chancroid produces at first a pustule; the earliest appearance of the initial lesion of syphilis on the contrary is in the form of a papule, which takes on superficial ulceration, increases in breadth and thickness, and is but slightly excavated, or frequently is elevated above the surrounding surface.

In experimental inoculation of the syphilitic virus, the lengthy incubation of the chancre should not be forgotten, nor the result be pronounced negative until after the lapse of at least six weeks without the appearance of a sore.

We have yet to consider those characters which are common to all the forms of chancre.

Induration was recognized at a very early period in the history of syphilis by John de Vigo,[1] Gabriel Fallopius,[2] Leonard Botal,[3] and

[1] "Nam ejus origo in partibus genitalibus, videlicet in vulva in mulieribus et in virga in hominibus, semper fuit cum pustulis parvis, interdum lividi coloris, aliquando nigri, non nunquam subalbidi, cum *callositate* eas circumdante." (Joan de Vigo, *Practica copiosa in Arte Chirurgica, etc.* Rome, 1514, lib. v.)

[2] Tractatus de Morbo Gallico, Patavium, 1564.

[3] Luis Venereæ Curandæ Ratio, Paris, 1563.

Ambrose Paré,[1] as a prominent symptom of the sore which precedes general syphilis; nearly forgotten by subsequent writers, though occasionally mentioned, as by Nicholas Blegny,[2] it has again assumed importance in modern times from the teachings of Hunter,[3] Bell,[4] and especially Ricord, and is now justly regarded as the most characteristic feature of a chancre, when seated upon a person exempt from previous syphilitic taint.

The induration of a chancre is a peculiar hardness of the tissues around and beneath the sore. Simple inflammation may occasion an effusion of plastic material and consequent engorgement about any sore; but specific induration is of an entirely distinct character. The latter is formed, as the French say, "*à froid*," that is, without inflammatory action; the deposit takes place in the absence of all the symptoms of inflammation, "pain, heat, redness, and swelling;" and so silently, so insidiously, that the patient is often ignorant of its presence, or discovers it only by accident. No event is more common than for a surgeon to be consulted by a man who states that he had a sore a few weeks ago, "which did not amount to much;" he "burnt it with caustic and it healed up;" but he has recently found that it left a "lump" behind it. This "lump" is specific induration and denotes that the constitution is infected. A gentleman recently applied to me for phymosis—neither congenital nor inflammatory, which occasioned no inconvenience except an inability to retract the prepuce. He was not aware that he had had any venereal trouble, but, on examination of the parts, a mass of induration as large as an almond was perceptible to the touch and almost to the sight—so great were its dimensions—situated about the furrow at the base of the glans. The phymosis was simply due to the mechanical obstruction presented by the induration to the retraction of the prepuce, and this difficulty alone induced him to seek advice. Frequently, also, patients apply to a surgeon for treatment for general syphilis, and honestly declare that they have never had a chancre, though the previous existence of such, and even its very site, are unmistakably indicated by the remaining induration.

Again, specific induration and inflammatory engorgement differ in their objective symptoms. The boundaries of the former are

[1] "S'il y a ulcère à la verge et s'il demeure dureté au lieu, telle chose infalliblement montre le malade avoir la variole." (Paré's works, first published at Paris, 1575, Book 19th.)

[2] L'Art de Guérir les Maladies Vénériennes, etc., Paris, 1673.

[3] Ricord and Hunter on Venereal, 2d Am. edition, Phil., 1859, p. 286.

[4] Treatise on Gonorrhœa Virulenta and Lues Venerea, London, 1793, vol. ii., p. 19

clearly defined, while the extent of the latter cannot be limited with nicety; the one terminates abruptly, the other shades gradually into the normal suppleness of the part; the first is freely movable upon, the second adherent to, the tissues beneath. The difference in the sensations they impart to the fingers is still greater; specific induration is so firm, hard, and resistant, that it is often compared to a "split-pea"[1] or mass of cartilage; the softer and doughy feel of common inflammatory engorgement requires no description. It is hardly necessary to say that there is no incompatibility between these two pathological conditions which can prevent their co-existence, and hence arises, in some few cases, a difficulty of diagnosis. The effect of simple inflammation, however, subsides in a few days, or in a week or two at farthest, and lays bare the specific induration, which may, for a time, have been buried beneath it; and under all circumstances reference may be made to the neighboring ganglia, the induration of which is equally constant and significative with that of the chancre.

In the masses of induration of considerable size to which the above description chiefly refers, the adventitious deposit occupies the skin or mucous membrane bordering upon the edges of the sore, and also the cellular tissue beneath it. There is another, but less common form of induration in which the deposit is confined to the mucous membrane alone, and does not involve the cellular tissue beneath. It most frequently occurs in connection with the superficial chancre, and is called the "parchment-induration" because it imparts to the fingers a sensation as if the erosion rested upon a thin layer of that material. Readily perceived in most cases, in others it may escape notice, especially to one not familiar with it.

The situation of the chancre influences to a certain extent the degree of development of the induration; which, for instance, is generally but slightly marked and of the parchment variety upon the walls of the vagina and the margin of the anus; while, on the contrary, it is fully developed in the furrow at the base of the glans and upon the lips. Some authorities have gone so far as to maintain that induration is entirely dependent upon the seat of the sore, and have instanced the uniformity with which all venereal ulcers upon the lips are indurated, in proof; but, as before stated, this objection

[1] Benjamin Bell usually has the credit of the comparison of induration to a split-pea, but reference to his work shows that he uses the term as indicative of the size of a chancre, and not of the consistency of its base. He says: "A real venereal chancre is seldom so large as the base of a split-pea, and the edges of the sore are elevated, somewhat hard, and painful." Op. cit., vol. i., p. 19.

to a duality of venereal poisons has been effectually exploded by recent experimental inoculations, in which chancroids with a perfectly soft base have been developed upon the region in question.

Ricord believes that the development of induration corresponds with the supply of lymphatic vessels; that the former is most marked where the latter are most abundant; and that the induration, in fact, consists in an inflammation of the capillary absorbents with effusion into the intervening tissue.[1] The tendency of induration to invade the lymphatic system favors this opinion, which, however, has not been corroborated, to my knowledge, by the necessary anatomical investigations. Those microscopists[2] who have examined the histology of induration concur in stating that it is composed of fibro-plastic elements—fusiform bodies, nucleated cells, free nuclei, and amorphous matter—infiltrating the layers of the derma and subcutaneous tissue, without any special characters to distinguish it from similar products of non-specific origin. These elements are not found in the secretion of the sore.

Ricord, to whose careful investigations I am indebted for a large part of the present section, has endeavored to determine the limits of time within which induration may take place. He states that it occurs most frequently during the first or second week after contagion; never before the third day, nor after the third week; that, consequently, if a sore is to be indurated at all, it will be so by the twenty-first day after the sexual act in which it originated. It is with great reluctance and hesitation that I dissent from so accurate an observer, but believing as I do in the incubation of the chancre, I cannot but think that this subject requires renewed investigation with the additional light we now possess. I believe it would be nearer the truth to substitute the words "after the appearance of the chancre" in place of "after contagion." Taking the former as the starting point, there can be no question that induration occurs within a very few days; I have almost invariably met with it during the first week, and should not hesitate to regard its absence, at the termination of three weeks, both in the sore itself and in the neighboring ganglia, as indicative that the patient was safe from constitutional infection.

Sigmund,[3] of Vienna, gives the following table of the dates *after*

[1] Leçons sur le Chancre, p. 86.

[2] Robin et Marchal de Calvi, Eléments Caractéristiques du Tissu Fibro-plastique et sur la Présence de ce Tissu dans l'Induration du Chancre. Séance de l'Académie des Sciences, Nov. 2, 1846. Lebert, Traité d'Anatomie Pathologique, vol. ii.

[3] British and For. Med.-Chir. Rev., Jan., 1857, p. 206; from the Wien Wochenschrift, No. 18.

contagion at which induration was first detected in 261 cases of chancres.

On the 9th day in	71 cases.
" 10th "	84 "
" 14th "	76 "
" 17th "	15 "
" 19th "	12 "
" 21st "	8 "

Mr. Babington, the English editor of Hunter on Venereal, advanced an opinion which has been adopted by a few authors, that induration may take place before the appearance of the chancre; but experience does not confirm this statement. After all, if it be admitted that all possible mischief is accomplished long before the chancre first appears, the exact date of the evolution of the induration possesses less practical importance than it assumed under the supposition that it marked the boundary line between local and constitutional syphilis.

Specific induration usually remains for a long time after the cicatrization of the chancre, and, unless dissipated by treatment, may, in most cases, be felt for at least two or three months, and often longer. Some statistics collected by M. Puche show that its persistency becomes rarer after the third month, and is quite exceptional after the eighth, though this surgeon reports thirteen cases in which it was perceptible from 390 to 2062 days after contagion; in nine of the thirteen, the induration occupied the furrow at the base of the glans, a favorite seat for its full development and long persistency. M. Puche met with still another instance in which induration persisted for nine years. I have met with several cases of two and three years' duration, and Ricord with one of thirty years. It follows from the above data that induration is an early symptom of syphilis, and that the time within which its presence or absence is of diagnostic value is limited, though variable in different cases.

Induration is sometimes much shorter lived; the parchment form especially, according to Ricord, *may* entirely disappear before the chancre heals, and the cicatrix present as soft a base as the chancroid. This form of induration is, however, in many instances, as durable as any other.

As the process of absorption goes on, the indurated mass becomes less firm and resistent, and gradually softens until it can finally no longer be detected. Occasionally a relapse takes place in which it resumes its original characters. I have seen such accompany a renewed outbreak of a syphilitic eruption; while, in other instances,

the exciting cause has appeared to be some local irritation, as a chancroid, vegetation, etc.

Unlike the chancroid, the chancre is rarely met with in groups of two or more upon the same subject. Of 456 patients, under the observation of Fournier at the Hôpital du Midi, 226 had but one and 115 several chancres; of the latter 86 had two, 20 had three, 5 had four, 2 had five, 1 had six, and 1 had nineteen. Debauge collected 60 cases at the Antiquaille Hospital, at Lyons, in 41 of which there was a single chancre, and in 19 several.[1] These statistics would show that the chancre is solitary in three cases to one in which it is multiple. The ratio is still greater in M. Clerc's observations, in which the chancre was single in 224 out of 267 cases. If multiple at all, it is almost always true that they are so as the immediate effect of contagion, and because several rents or abrasions were inoculated together in the sexual act. If solitary at first, they continue to be so; since successive chancres rarely spring up in the neighborhood, as in the case of the chancroid, owing to the fact that the virus ceases to act upon the system as soon as it is once infected. This explanation is alone sufficient, without calling in the aid, as Ricord does, of the paucity of the secretion, which is copious enough to inoculate sound persons.

The insidious manner in which induration takes place characterizes the whole development of the chancre, and it is not surprising that it often exists for some time before it is perceived by the patient, or escapes notice entirely. The explanation of many "bubons d'emblée" and supposed cases of syphilis without chancre is evident. Unfortunately the profession has been too prone to go to extremes in taking the testimony of venereal patients: by some their statements are received implicitly; by others they are as constantly disbelieved; while few draw the distinction between honesty and ignorance, necessarily arising from want of experience, and the absence of medical knowledge.

The secretion from a chancre is much less copious than that from the chancroid. This difference is especially evident in the superficial erosion, but is also perceptible in the excavated forms, the discharge from which is less free and purulent than in the chancroid.

Numerous experiments show that the immunity conferred by one attack of syphilis extends in most cases even to the initiatory sore. This fact was first announced by M. Clerc in 1855. Fournier inoculated the discharge of ninety-nine chancres upon the patients them-

[1] Op. cit., p. 6.

selves, and succeeded in but one, in whom the experiment was performed within a very short period after contagion. M. Puche states as the result of his own experiments that auto-inoculation of the chancre is successful in only two per cent. Poisson obtained like results in fifty-two cases,[1] and Laroyenne was unsuccessful in every one of nineteen.[2] Do not these facts tend to show that the chancre is from the very first a constitutional lesion? Their bearing upon the use of artificial inoculation as a means of diagnosis is evident; failure favoring the supposition that the sore is a chancre.

Whenever auto-inoculation has proved successful, it has been with virus taken from the sore at a very early period of its existence. In the same manner vaccine lymph may be successfully reinoculated within a day or two after the first appearance of the future pustule, while if the attempt be deferred until its full development, it will fail. Hence we infer, that although absorption is instantaneous and general infection is inevitable from the first, yet that time is requisite to bring the system fully under the influence of the virus.

Mr. Henry Lee, of London, as early as 1856, also called attention to the difficulty of inoculating chancres, or "syphilitic sores affected with specific adhesive inflammation," upon the persons bearing them.[3] This surgeon has since maintained that if a chancre—the discharge from which, under ordinary circumstances, he believes to be destitute of pus-globules—be irritated, as by the application of a blister or ung. sabinæ, until its secretion becomes purulent, it is susceptible of inoculation.[4] Mr. Lee's experiments require confirmation before coming to any conclusion regarding them. It is difficult to believe that in the numerous French observations the sores had always escaped irritation and that the discharge was invariably serous.

The difficulty of inoculating the secretion of a chancre is equally as great upon a person who has arrived at the stage of secondary syphilis as upon one who has but recently been affected.

The chancre, as a general rule, is of somewhat shorter duration than the chancroid, but often remains until after the appearance of secondary symptoms—a remark which I should not think it necessary to make had I not met with persons who supposed that primary syphilis must terminate before secondary commenced! Of 97 cases observed by Bassereau, in which no treatment had been employed,

[1] Leçons sur le Chancre, p. 274.
[2] Annuaire de la Syphilis, année 1858, p. 241.
[3] British and For. Med.-Chir. Rev., Oct., 1856.
[4] Ibid. for April, 1859.

syphilitic erythema, one of the earliest general symptoms, occurred in 58 before, in 18 during, and in 21 after the cicatrization of the chancre.[1]

Phagedena generally spares the chancre or limits its ravages to the destruction of the surrounding induration. In rare instances, however, an extensive phagedenic ulcer is the initial lesion of syphilis, and, in this case, the subsequent general symptoms are usually of an aggravated character. Babington says: "The secondary symptoms which follow the phagedenic sore are peculiarly severe and intractable. They commonly consist of rupia, sloughing of the throat, ulceration of the nose, severe and obstinate muscular pains, and afterwards inflammation of the periosteum and bones. Similar complaints will follow the ordinary chancre; but when they follow a phagedenic sore they are very difficult to be cured; and it is not uncommon that the constitution of the patient should at length give way under them, and that the case should terminate fatally."[2]

Bassereau also found a correspondence between the severity of the chancre and that of the syphilitic eruption. Thus, of 68 chancres which preceded a pustular syphilide, 20 were phagedenic and 4 others serpiginous;[3] and 18 of 50 chancres followed by a tubercular eruption produced destruction of the tissues to a greater or less extent. It will be recollected, on the contrary, that 143 of 170 chancres followed by syphilitic erythema were mere erosions, and that 10 only exhibited a very slight tendency to phagedena. Bassereau states that a similar relation exists between the primary sore and other syphilitic lesions, and lays down the rule, that "mild syphilitic eruptions and, in general, those constitutional symptoms which exhibit but little tendency to suppurate, follow the mild forms of chancre; while pustular eruptions, and, at a later period, ulcerative affections of the skin, exostoses terminating in suppuration, necroses, and caries, follow phagedenic chancres." The degree of ulceration of the chancre is also regarded by Diday[4] as one of the most valuable indications to enable us to determine whether the attack of syphilis is to be mild or severe, and whether mercury can or cannot be dispensed with in the treatment. Admitting the truth of this rule, it does not follow that the condition of the chancre in any manner determines the severity of subsequent symptoms, but merely that it is an indication of the activity of the virus and of the state of the patient's system—the two causes upon which the severity of the attack chiefly depends.

[1] Op. cit., p. 180.
[2] Ricord and Hunter on Venereal, 2d ed., p 351.
[3] Op, cit., p. 442.
[4] Histoire Naturelle de la Syphilis, p. 84.

A chancre situated upon the external integument, as the sheath of the penis, often leaves a peculiar discoloration of the skin of a sombre brown or brownish-red color, which is never seen after the chancroid; in time its dark hue fades into a white. An instance of this kind is figured by Ricord in his *Iconographie des Maladies Vénériennes*, pl. xviii.

Ricord first called attention to the fact, which has since been verified by many observers, that a chancre during the reparative period may be transformed into a mucous patch, and thus a primary be changed into a secondary lesion. This transformation may take place upon any part of the body whether of skin or mucous membrane, but more frequently upon the latter, especially when habitually in contact with an opposed surface, whereby heat and moisture are maintained; as, for instance, upon the internal surface of the prepuce and labia majora, and upon the lips and tongue. Davasse and Deville have carefully studied the progressive changes by which this process is accomplished.[1] The surface of the chancre loses its grayish aspect and fills up with florid granulations, commencing at the circumference, as in the ordinary period of repair; but just as these changes are reaching the centre of the sore, a narrow white border of plastic material appears around its margin, and extending towards the centre, finally covers it with the membranous pellicle which is characteristic of a mucous patch. If the patient does not come under observation until these changes have been effected, the initial lesion of his disease may be supposed to be a mucous patch instead of a chancre.

We have already seen that most chancroids are free from ganglionic reaction, and that when this occurs it is always inflammatory and chiefly involves one ganglion, which tends to suppuration and often furnishes inoculable pus. The chancre, on the contrary, gives rise to changes in the neighboring lymphatic ganglia, which, by their constancy and the peculiarity of their symptoms, are of the highest value in diagnosis. A number of these bodies become enlarged and indurated in a similar manner to the base of the chancre, without inflammatory action; they do not suppurate except in rare instances, and the pus is never inoculable. The induration of the neighboring ganglia, attendant upon a chancre, will be more fully described in the next chapter.

DIAGNOSIS OF THE CHANCRE.—For much that relates to the diagnosis of the initial lesion of syphilis, the reader is referred to the

[1] Études Cliniques des Maladies Vénériennes; des Plaques Muqueuses. Arch Gén. de Méd., 4e série, vol. ix., p. 182.

remarks and the diagnostic table in a preceding chapter concerning the chancroid (p. 347).

The most valuable diagnostic signs of a chancre are its period of incubation, the induration of its base, and the induration of the neighboring ganglia. Both of the latter are rarely, if ever, wanting. Of the two, I believe induration of the ganglia to be the more constant. Absence of induration of the base cannot always be depended upon, even according to Ricord's showing, who says that this symptom sometimes disappears after a few days' duration, and it may, therefore, have passed away before the patient comes under the care of the surgeon. Cases are reported by competent observers of chancres with a perfectly soft base, which have yet been followed by general syphilis; such instances, however, are extremely rare. If a caustic or astringent has recently been applied to a sore, induration of its base should be admitted with caution: examine the condition of the neighboring ganglia; direct simple applications only for a week or two, and see if the hardness persists. Inflammation of the surrounding tissues may counterfeit or mask specific induration: here, again, refer to the ganglia, or defer the diagnosis until the inflammatory products shall have time to undergo absorption.

Even admitting that cases may possibly occur in which induration of the base and of the ganglia are both absent, yet these two prominent symptoms of a chancre are as constant and as valuable as any others in the whole range of pathology: more than this we can neither ask nor expect. Since absorption of the syphilitic virus takes place instantaneously so soon as it has penetrated beneath the epidermis, and since there is, therefore, no opportunity of preventing constitutional infection by abortive treatment, there is less necessity for an early diagnosis than was formerly supposed; and, in obscure cases, we may wait, if necessary, until after the time within which, if ever, secondary symptoms invariably appear.

The superficial form of chancre does not differ materially in appearance from a common excoriation, or from the superficial ulcerations of balanitis; it may be distinguished by its late appearance after exposure, its induration, and greater persistency. No suspicion of a chancre, however, may be awakened if the erosion be surrounded by simple inflammation of the mucous membrane, unless the induration of the inguinal ganglia be discovered, and hence the condition of these bodies should always be examined in apparent cases of balanitis.

Inoculation of the secretion of a sore upon the person bearing it

is an unfailing test of a chancroid, but of no value in the diagnosis of chancres.

Urethral Chancre.—When a chancre is seated within the urethra beyond the field of vision, it may readily escape detection, and the case be mistaken for one of gonorrhœa. There are certain phenomena in an apparent case of gonorrhœa which should lead the surgeon to suspect and search for a urethral chancre; and these are a small amount of discharge, which is chiefly watery and mixed with blood, and the location of the pain, especially during the passage of the urine, at a fixed point. The specific induration which surrounds the sore is generally perceptible to the touch; the glands of the groin present their characteristic changes; and a hard, indurated cord (induration of the lymphatics) may sometimes be felt extending from the seat of the chancre towards the root of the penis. The induration of a urethral chancre should be distinguished from the inflammatory engorgement of the chancroid, and from the hardness due to an inflamed follicle sometimes met with in gonorrhœa. Inflammatory engorgement is more diffused, less accurately defined, and more transient than specific induration, and is also attended by pain and tenderness on pressure. In doubtful cases the condition of the inguinal ganglia will almost always be sufficient to establish the diagnosis.

Chancres about the Mouth.—Chancres of the lips are generally superficial, and very rarely excavated unless subjected to irritation. Their outline is ovoid, the longer axis parallel to the buccal fissure, and their general aspect is the same as that of the superficial chancre, to which variety they belong. When they involve the labial commissure they are divided into two portions, separated by a deep ulcerated fissure at the angle of the mouth.

Chancres upon the tongue are most frequent near its extremity. They are generally of small size, and are more deeply excavated than those upon the lips. Chancres have also been observed upon the gums, internal surface of the cheeks, palate, and tonsils.

Induration is nowhere more fully developed than upon the lips, except, perhaps, in the balano-preputial furrow; and is often so massive as to cause the lip to protrude and disfigure the countenance. It is less marked at the angle of the mouth, upon the tongue, etc., though it may usually be detected without difficulty. The parchment form of induration is also met with upon this region in some instances.

The ganglia connected with the seat of the sore by means of the lymphatic vessels take on induration, as in chancres upon other parts

of the body; and, in most cases, they belong either to the anterior or posterior sub-maxillary groups.

Phagedena is a rare complication of the buccal chancre. A single instance was observed at Cullerier's clinique, in which irritant applications had caused the ulcer to extend until it involved one-half of the lower lip and the inferior half of the cheek.[1]

TREATMENT OF THE CHANCRE.—It was formerly supposed that a chancre was at first a mere local affection, and that the general circulation did not become contaminated until some days after the appearance of the ulcer; and hence that its early and complete destruction was capable of averting infection of the constitution. The advice was therefore given to cauterize a chancre as soon as it appeared, and we were told that if the caustic was sufficiently powerful to kill the tissues to an extent exceeding the sphere of specific influence of the virus, that a simple wound would be left after the fall of the eschar, and our patient would be preserved from syphilitic infection. This treatment, known as the "abortive treatment of chancre," was supported by the distinguished names of Ricord and Sigmund, who assigned *the fourth day after contagion* as the limit within which destructive cauterization could be employed with a certainty of success.

Belief in the efficacy of this treatment is no longer admissible, and never could have been once entertained, had it not been for confounding the chancroid and syphilis, whereby surgeons were led to believe that when a patient whose chancroid had been cauterized escaped general syphilis, *post hoc ergo propter hoc*, his immunity was due to the cauterization.

A chancre is never a mere local lesion, as is proved by its period of incubation, by the analogy of other morbid poisons, and by the fact, as shown by repeated experiments, that its destruction within a few days and even a few hours *after its appearance*, fails to avert constitutional infection.

The average duration of the incubation of a chancre is from two to three weeks. During this period the inoculated point remains in a state of quiescence and exhibits no traces of inflammation; hence the subsequent appearance of the chancre can only be ascribed to the reaction of the absorbed virus. It may be remarked, in passing, that this period of incubation renders the conditions of the so-called abortive treatment (cauterization within four days *after contagion*)

[1] BUREBERT, Du Chancre de la Bouche, etc., Thèse de Paris, 1858.

impracticable, since the sore very rarely appears until the time specified has elapsed; and the same consideration increases the probability that Ricord and Sigmund, in their "thousands" of supposed successful cases, really applied the method only to the chancroid. Experiments with other morbid poisons prove that absorption is almost instantaneous. Bousquet inoculated the vaccine virus, and immediately applied cups and washed the part with chlorinated water without preventing the evolution of a pustule.[1] Renault, Surgeon of the Veterinary School at Alfort, inoculated horses with acute glanders, excised the part and applied the actual cautery one hour afterwards, yet the animals died of the disease.[2] Similar experiments with the sheep-pox virus proved that its absorption does not require more than five minutes. Hence analogy would show that the syphilitic virus also reaches the general circulation almost instantaneously after its implantation beneath the epidermis.

We have still farther the evidence of direct experiment. Numerous cases are recorded in which destructive cauterization within a few days, and *even a few hours after the development of the chancre*, has failed to avert constitutional infection. Diday has thoroughly cauterized chancres four days and a half and others five days after coitus, and secondary symptoms have still appeared. In another case, occurring in a patient who had watched himself with the greatest care from day to day and almost from hour to hour, the chancre was not developed until a month after the sexual act, but the abortive treatment was applied within *six hours* of its first appearance; the sore healed in the course of three days, but secondary symptoms appeared three weeks afterwards.[3] More recently,[4] Diday has reported several additional cases as follows:—

Case 1. A man, aged 45, somewhat of a syphilophobist, and consequently very attentive to the condition of his genital organs, consulted Diday, Sept. 24th, 1858, for a chancre which he had first observed three days before. The sore was at once cauterized with the paste of vegetable carbon and sulphuric acid, in use at the Hôpital du Midi.

The patient was seen again Oct. 3, when the chancre was found to have healed and to have left a healthy-looking cicatrix. Slight induration of a few ganglia in the groins inspired, however, some doubts as to the future.

[1] Traité de la Vaccine.
[2] Académie des Sciences, 1849.
[3] Gaz. Méd. de Lyon, March 1, 1858.
[4] Annuaire de la Syphilis, année 1858, p. 134.

Nov. 8. The cicatrix presented a well-marked mass of induration, and the glands of both groins were also evidently indurated; and the patient complained of scabs in his hair.

Nov. 19. A papular eruption of a decided copper color appeared over the whole body.

CASE 2. A young man who had been subject to herpes præputialis, and who had been in the habit of consulting his physician for each renewed attack, presented himself, Sept. 21, 1858, with a small chancre upon the integument of the penis, which had existed but two days only. Canquoin's paste was at once applied and left on the ulcer for two hours.

A week after, he was apparently well, but a slight hardness, like a grain of millet seed, felt when the cicatrix was pressed between the fingers, rendered the prognosis somewhat doubtful.

Oct. 27. Syphilitic roseola began to appear upon the abdomen, and by Nov. 4, became general and unmistakable. The patient also had acne capitis, engorgement of the cervical ganglia, headache, etc.

CASE 3. A young man, who, from former experience, was familiar with the appearance of chancres, sought advice Oct. 14, 1858, for a small abrasion, which, as he stated, appeared only twenty-four hours before. It was immediately burnt with the carbo-sulphuric paste.

Oct. 28. The sore had cicatrized but had left well-marked induration, which also involved the inguinal ganglia.

Nov. 26. He presented a papular syphilitic eruption, and scabs upon the hairy scalp.

The following case is reported by M. Langlebert.[1]

CASE 4. A student of medicine, who was thoroughly informed upon all subjects connected with syphilis, consulted Langlebert for a small ulcer behind the corona glandis which he was certain had appeared only two days before. The sore was very superficial, scarcely larger than the head of a pin, was not indurated, nor accompanied by engorgement of the inguinal ganglia. It was cauterized the same day with nitrate of silver, and healed in less than a week.

No induration appeared in the groins, but two months after general syphilis declared itself.

Langston Parker[2] says: "I have destroyed an ulcer thoroughly and completely, and all the surrounding tissues, to the depth of half an inch, in two hours after the appearance of the chancre, and yet bad constitutional symptoms have followed."

[1] Moniteur des Hôpitaux, Dec. 21, 1858.

[2] Modern Treatment of Syphilitic Diseases, 4th ed., p. 119.

It was desirable that thus much should be said in deference to any of my readers who may have imbibed their only notions of venereal from the teachings of authorities a few years ago; but the "abortive treatment of syphilis" is now so generally recognized to have been founded in error, that I need not dilate farther on the subject.

But if destructive cauterization is inefficacious as a means of preventing constitutional infection, it is equally unnecessary in most cases for the purpose of hastening the cicatrization of the chancre, which rarely tends to spread, and which is commonly sufficiently under the control of mercury. I would, therefore, limit its application to those few chancres which are complicated with phagedena, and to those cases in which conjugal relations and the necessity of secrecy render it desirable to effect cicatrization of the sore as speedily as possible in order that coitus may be indulged in with comparative safety. When employed, the effect upon the ulcer is much the same as with the chancroid; cicatrization is hastened, but induration reappears in the wound and general symptoms are developed within the normal period. The mode of its application has already been described.

The topical applications to a chancre are absolutely the same as those required in the case of a chancroid, and need not be repeated here. In the superficial variety, however, which is also the most frequent, the degree of ulceration and the amount of the secretion are so slight, that the simple interposition between the glans and prepuce of a piece of dry lint, or lint soaked in some mild astringent, is all that is necessary, and the dressing need not be changed oftener than once or twice in the twenty-four hours.

General Treatment.—The chancre is decidedly under the influence of mercury, and presents in this respect a marked contrast to the chancroid. Under the use of this mineral reparative action is speedily induced, and unless the ulcer be deep and extensive or the system much depressed, complete cicatrization may be promised the patient in the course of from one to three weeks.

I do not propose at present to enter fully into the subject of the treatment of syphilis, which of course includes the treatment of its initial lesion. A few remarks, however, may be better made here than elsewhere. And in the first place, let me say that no course of mercury administered for a chancre, however thorough or prolonged, is likely to prevent the subsequent evolution of general manifestations. I make this statement confidently as the result of my own experience and that of others. In the very many attempts that I have made to subdue the disease during the existence of the

primary ulcer and prior to the first general manifestation, I have never succeeded but in two or three instances, and the great proportion of failures leads me to suspect the correctness of my diagnosis in the few cases of apparent success. Diday's experience coincides with my own, and success is such a rarity with Rollet that we find him adducing a single instance in confirmation of its possibility. Finding, therefore, that such attempts are commonly fruitless, I have ceased to undertake them; and if I use mercury at all for primary syphilis, I do it simply for the purpose of healing the ulcer, and stop as soon as this object has been accomplished.

Those cases of chancre in which it may be advisable to administer mercury are the following:—

1. Chancres which, from their size, depth, and progress, occasion pain and inconvenience, or which threaten to destroy important parts.

2. Chancres occurring in married persons who cannot long avoid sexual intercourse without exciting suspicion.

3. Chancres in persons who are either too anxious or too unreasonable to be willing to submit to delay.

In other cases, especially when the sore is superficial and attended with little or no inconvenience, I prefer to delay the use of mercury until secondary symptoms appear, meanwhile resorting to tonics, as one of the preparations of iron, iodide of potassium or cod-liver oil.

In using mercurials during this period of syphilis, I commonly employ either the blue mass or grey powder; giving from three to five grains twice a day for a week; increasing the dose at the end of that time if, as is rarely the case, there is no perceptible effect upon the ulcer; always avoiding action upon the gums and bowels, and suspending treatment as soon as reparative action is established. After cicatrization of the sore it is desirable to resort to iodide of potassium and iron, in order to combat the chloro-anemia which exists in the early stage of syphilis, and thus diminish the severity of the premonitory symptoms which usually usher in secondary manifestations.

CHAPTER III.

INDURATION OF THE GANGLIA, AND OF THE LYMPHATICS.

INDURATION OF THE GANGLIA.—This affection is only met with in connection with a chancre, of which it is as necessary an attendant and affords as valuable an indication, as the induration of the base of the sore. Of 120 cases of syphilitic erythema, Bassereau found that in 116 glandular induration had accompanied the chancre, and suppuration took place in a single instance only; in three alone had there been no appreciable changes in the inguinal ganglia.

Induration of the ganglia is always developed at an early period—usually during the first week, and invariably within the first three weeks of the existence of the ulcer, and follows the induration of its base within a period of a few days. According to Von Bärensprung, induration of the ganglia appears from ten to twelve days after the induration of the point of contagion; Zeissl says fourteen to twenty-one days, and adds, "at all events a short time must be allowed before the glands can be affected, and hence before we can be sure of the diagnosis of syphilitic infection."

The symptoms of glandular induration attendant upon a chancre are the following: All the superficial ganglia in one, and generally in both groins, become enlarged, and attain the size of a filbert or almond. One is frequently found to be more developed than the others, which surround it like satellites. This change takes place without any symptoms of acute inflammation, and so insidiously that the patient may be entirely ignorant of it, and deny its existence; but the surgeon, whose suspicion has already been excited by the induration of the ulcer, on examination of the groin, finds a "pleiad" of small tumors, of a cartilaginous hardness, and freely movable upon each other and the surrounding tissues. When firm pressure is made upon them, the patient sometimes complains of slight tenderness but not of severe pain. They preserve their indolent character throughout their whole course, and do not become inflamed or suppurate unless under the influence of some aggravating cause, as violence, a strumous diathesis, general cachexia, or

the coexistence of a chancroid or urethritis; and, unless attended by a chancroid, the pus is never inoculable.

Induration of the ganglia and induration of the base of a chancre are in their nature and signification one; but, as elsewhere remarked, the first is, in most cases, the more constant and persistent, and, therefore, the more valuable symptom. When the latter is imperfectly developed or obscured by common inflammation, reference may be made to the former, which will rarely fail to afford the desired information; after the latter has disappeared, the former often persists for months, as an index, that upon some part of the superficies, the lymphatics of which rendezvous at these ganglia, syphilitic inoculation has taken place; and thus it determines not only the existence but the approximate seat of a chancre, and may afford invaluable aid in unravelling the history of venereal cases. For instance, induration of the inguinal ganglia points to the genital organs, including the internal surface of the urethra, and to the hypogastric region; that of the external group near the anterior superior spine of the ilium to the anus; that of the submaxillary glands to the lips, mouth, and tongue; that of the axillary ganglia or those about the elbow to the hand or arm; that of the præauricular ganglion to the eye-lid and its neighborhood; and so each region has its recording index.

From induration of the inguinal ganglia, I have repeatedly been able to satisfy myself of the previous existence of a chancre in opposition to the asseverations of patients, and even when no cicatrix or specific induration could be found upon the genital organs. For instance, in the spring and summer of last year, a young man had two attacks of what was apparently simple gonorrhœa. In the autumn he applied to me with syphilitic iritis, alopecia, acne capitis, and post-cervical engorgement, and there could be no doubt that he had had a chancre upon the genitals, although he was quite unconscious of the fact, since each groin presented the characteristic indurated pleiad. One of his attacks of gonorrhœa was probably complicated with a urethral chancre.

Ricord relates the following case:[1]—

"Two or three years ago, one of our most prominent young physicians came with a frightened air to my office, when the following conversation ensued: 'Until now I had faith in your doctrines, but I find them at fault, and in my own person. It is too bad. What is

[1] Lettres sur la Syphilis, 2d ed., p. 45.

this?' (removing his clothes and showing me his breast and back, I examine him and reply:—

"'A fine syphilitic roseola.'

"'Syphilitic, did you say? Are you sure?'

"'Perfectly so.'

"'Very well! You condemn yourself. I have never in my life had any venereal symptom but a gonorrhœa, and that was twelve years ago.'

"I examine him from head to foot, and say to him:—

"'My friend, you have *recently* had a chancre on your right hand, which was situated neither upon the thumb nor index, but upon one of the remaining fingers.'

"'You are joking.'

"'Not at all; you have a bubo at the present moment;' and I place his finger upon a ganglion still engorged near the elbow-joint. After thinking a moment, he then told me that a few months before, while treating a woman with chancre, an ulcer appeared on the middle finger of his right hand, to which he paid but little attention, and which had soon healed. 'This,' said I, 'is the source of your roseola; act accordingly.'"

I do not recollect a single instance of a venereal ulcer in my own practice, which ultimately proved to be a chancre, in which induration of the neighboring ganglia was wanting; yet Bassereau's statistics above referred to would appear to show that this may occasionally happen; though it should be observed that many of this surgeon's patients were not seen until a month or two after contagion, by which time this symptom may possibly have disappeared. Yet I think that the absence of induration of the base of a chancre and of its neighboring ganglia may, in rare instances, be admitted, without materially detracting from the value set upon their diagnostic and prognostic indications; for why should absolute constancy be expected in syphilitic symptoms any more than in those of other diseases, and in the whole range of pathology it would be difficult to find two which are more uniformly present than these. Induration does not constitute the essence of syphilis, which lies in the virus; neither the base of the sore nor the ganglia are indurated when a chancre is implanted upon a system already contaminated with syphilis, yet the poison remains the same.

The only affection liable to be confounded with specific induration is strumous enlargement of the ganglia, and I have met with a number of cases, in which the diagnosis remained for a while in doubt, owing to ignorance of the condition of the glands before contagion.

In persons of a strumous diathesis who can give no reliable account of their previous history, this difficulty must sometimes arise.

It is perhaps unnecessary to remind the reader that glandular induration is not to be looked for in old cases of syphilis of several years' duration. Like the induration of the chancre, it disappears, even without treatment, after a variable period, although somewhat more persistent than the latter.

The value of suppuration of the glands in a suspected case of syphilis as an element of diagnosis is a question of considerable practical importance. A patient with general symptoms of a doubtful character seeks advice of a surgeon, who learns that several years ago he had a venereal sore, but can obtain no accurate description of its symptoms. On farther inquiry he also ascertains that there was tumefaction of the glands in the groin, and the patient rarely fails to remember whether they suppurated or not—a fact which may also be determined in most cases by the presence or absence of a cicatrix. What light will this investigation throw upon the nature of the sore? If the description above given be correct, *the fact that suppuration took place will favor but will not absolutely prove the supposition that the sore was a chancroid. It is a common but not invariable rule that general syphilis does not follow an open bubo.*

Indolence is one of the chief characteristics of glandular induration, but to deny that suppuration ever takes place, as some authors have done, is to assert that induration protects the ganglia from every cause of acute inflammation, which is evidently absurd. If the sore be of the mixed variety, or if a chancroid and a chancre coexist upon the genitals, a virulent bubo and general syphilis may both follow. A remarkable instance of this kind has already been related upon page 367.

Again, irritant applications to the chancre, external violence, alcoholic stimulants, excessive coitus, gonorrhœa, or fatigue, may excite common inflammation, terminating in an abscess, of ganglia, indurated in consequence of constitutional infection; but the most fruitful source is the strumous diathesis or general debility. The following case will illustrate the fact that suppuration may be due to several causes combined, independently of the influence of the virus upon the ganglia:—

B. belonged to a strumous family. His sister, aged 17, had been afflicted with an aggravated form of chronic eczema since early infancy. His brother, after hardship and exposure upon a wreck,

was confined to his bed for six months with suppuration of the inguinal glands. B., who had always enjoyed good health, contracted a chancre in June, 1859, followed by glandular induration. Syphilitic erythema appeared in September, when the glands, which until then had been indolent, became inflamed, suppurated, and remained open six weeks. The general symptoms proved to be very obstinate, and he was still under treatment in July, 1860, when, after violent exercise at leap-frog, another abscess formed in the same groin.

It will be noticed in this case, that the inguinal glands remained in a quiescent state for nearly three months after the healing of the chancre, and their suppuration at the end of this time can only be ascribed to the strumous diathesis of the patient, and also, in a measure, to the febrile excitement preceding the syphilitic eruption.

Statistics collected by various observers concur in showing the rarity, but yet the possibility of a suppurating bubo attending a chancre followed by secondary symptoms. The following table which I have compiled from Bassereau, exhibits: 1st. The number of cases of syphilis under observation, which were attended by an affection of the ganglia; 2d. The number which suppurated; and 3d. The form of eruption which subsequently appeared:—

	Whole Number.	Suppurated.	Form of Eruption.
	117	1	Erythematous.
	42	5	Papular.
	108	1	Mucous patches.
	12	1	Vesicular.
	54	4	Pustular.
	50	4	Tubercular.
Total	383	16	

Thus in 383 cases of chancre attended by an affection of the ganglia and followed by secondary symptoms, there were only sixteen suppurating buboes. It is also worthy of notice that the number of suppurating buboes was much greater when the subsequent eruption was other than erythematous, or, in other words, in the severe cases of syphilis.

Fournier states that in the large number of chancres treated by Ricord, at the Hôpital du Midi, in the year 1856, there were only three which were accompanied by suppurating buboes.

Mr. Henry Lee, in an analysis of 1409 cases of venereal disease, "excluding simple gonorrhœa," recorded in the books of Lock Hospital, London, found ninety-eight cases of secondary symptoms, complicated with suppurating bubo, but in all, with the exception

of six, there was reason to believe that the latter affection was due to a distinct contagion from the one which produced the former, or to causes independent of the syphilitic virus.[1]

Bassereau reviews this subject in so clear a light, that I shall quote his remarks: "There is a fact which is not recognized by most writers on syphilis, and of which many practitioners are ignorant; I refer to the rarity of suppurating buboes attending those ulcers which precede general syphilis. The inverse proposition, viz., that general syphilis is rare after sores attended by suppurating buboes, is equally true, and as generally unknown, although of great practical importance. It is not to be inferred, however, that every person who has a venereal ulcer and indolent ganglionary engorgement must necessarily have general syphilis; nor that the appearance of suppuration in a bubo is a guarantee that the patient will be free from all general manifestations; since very many inflamed ganglia, which do not suppurate, are never accompanied by infection of the system, and a few suppurating buboes are succeeded by general syphilis. But though suppuration and indolence are not symptoms of absolute value, they at least furnish a strong presumption as to the future, and hence afford diagnostic and therapeutic indications of great importance. Even many years after contagion, data with regard to the course pursued by any glandular engorgement which accompanied the sore, will assist us in determining the character of symptoms, the nature of which appears doubtful. Suppose, for instance, that we wish to know whether a cutaneous eruption or ostitis is syphilitic; if we find as antecedents an ulcer and a suppurating bubo, there is little probability of its specific origin; and though mercury is not absolutely contra-indicated, prudence will lead us not to employ it longer than is necessary to test its effect.

"The early writers on syphilis did not include suppurating buboes among the symptoms which preceded those general eruptions which then bore the name of 'the French disease;' and when the efficacy of mercury in the treatment of the new disease was recognized, they did not administer it indiscriminately to all persons affected with ulcers upon the genital organs and with buboes, without distinguishing between the different forms of these symptoms. This fact may be established by reading their writings. The first half of the sixteenth century had not, however, passed, before they began to depart from these sound doctrines; but suppurating buboes

[1] On the Non-mercurial Treatment of Certain Forms of Syphilitic Disease; Analysis of 1400 cases. Association Med. Journal, Dec. 7, 1855.

had no sooner been confounded with the symptoms of 'the French disease,' than physicians noticed that they apparently afforded protection against general manifestations. Consult with regard to this point Nicholas Massa, Mathiolus, Antonius Lecoq, and Botal; they all call attention to this fact, and William Rondelet comes still nearer to the truth when he says that buboes which undergo resolution, and those which are indurated and show no tendency to suppurate, are certain indications that general syphilis is imminent: 'Si qui dolores patiantur, præcesseritque exulceratio in mentula intra vel extra et bubones venerei qui non profluxerint sed retrocesserint vel indurati sint, eos morbo gallico laborare certo et intrepide, etiamsi negent, affirmare possumus.'"

INDURATION OF THE LYMPHATICS.—As both the simple and virulent bubo have their occasional attendants in simple and virulent lymphangitis, so has glandular induration its accompanying induration of the lymphatics, a more constant attendant, though not invariably present, than either of the former.

Specific engorgement of the lymphatics is dependent upon changes in the walls of these vessels identical with those which occasion induration of the base of the chancre and of the ganglia, and is characterized by the same three important symptoms, viz., induration absence of inflammation, and persistency.

The indurated vessel feels like a hard cord running from the neighborhood of the chancre towards the pubes along the upper surface of the penis in the course of the dorsal vein and artery, or, in a few instances, it occupies the side of this organ. It is generally single, but sometimes multiple; of the size of a crow or goose-quill; in some cases of uniform diameter, when it communicates to the fingers a sensation like that of the vas deferens, while in others it is swollen at regular intervals like a necklace, or is, as botanists would say, moniliform. The distal extremity arises in the induration surrounding the chancre, and the cord can generally be traced for two or three inches towards the pubes, sometimes to the base of this prominence, but rarely as far as the indurated ganglia in the groin.

Induration of the lymphatics is most frequently observed upon the penis, but is not limited to this organ. Bassereau relates a case of chancre upon the cheek, in which a hard cord could be traced from the indurated base of the sore to an indurated ganglion beneath the angle of the jaw.

Induration of the lymphatics appears about the same time and in

the same manner as that of the base of the chancre, and the two generally correspond in degree of development. As already stated, the former is less constant than the latter, but if sought for may be found in a large proportion of cases.

Induration of the lymphatics usually undergoes resolution about the same time as that of the base of the sore; but in a few rare instances it becomes inflamed and terminates in suppuration, when fistulous openings may form along the course of the vessel. Bassereau met with three cases in which the induration of the chancre took on inflammatory action and was transformed into a phlegmonous tumor, the cavity of which was found to communicate with the interior of an hypertrophied lymphatic, through which a probe could be passed up to the pubes. In one instance he was able to make a post-mortem examination, the patient having died of an intercurrent acute disease. The dorsal vein and artery were found to be intact, and the fistulous canal evidently consisted of an hypertrophied lymphatic with hard and thickened walls, which could be traced from the induration of the chancre to the right inguinal ganglia.

Induration of the lymphatics may readily be distinguished with care from the dorsal vein and artery. It is more liable to be confounded with simple or virulent lymphangitis. The diagnostic symptoms have already been given when describing the latter.

This symptom of a chancre has the same prognostic signification as the induration of the base of the sore and the inguinal ganglia, and denotes that the constitution is already infected and that general syphilis will soon make its appearance.

TREATMENT OF INDURATION OF THE GANGLIA AND LYMPHATICS.—Uncomplicated cases of indurated ganglia require absolutely no local treatment whatever. When, therefore, an otherwise healthy patient with a chancre and induration of the neighboring ganglia anxiously inquires whether he is likely to be laid up with a suppurating bubo, he may be assured that there is no danger unless he commit some great imprudence. Under the mercurial treatment required by the constitutional infection which has already taken place, the indurated ganglia gradually diminish in size and lose the slight degree of tenderness which they possessed. In the exceptional cases of suppuration the treatment is the same as for inflammatory buboes, though generally less active.

The same remarks apply to the treatment of induration of the lymphatics.

CHAPTER IV.

GENERAL SYPHILIS.—INTRODUCTORY REMARKS.

THE earliest manifestation of constitutional infection is the chancre situated at the point where the virus entered the system, and the indurated ganglia in its immediate neighborhood. These, strictly speaking, constitute primary syphilis.[1] Subsequently there is an interval during which the virus gives no evidence of its presence; but immediately following this period of latency the poison resumes its activity and gives rise to various symptoms, the seat of which has no constant relation with that of the primary sore, and which may occupy distant parts of the body. They are therefore called "General" symptoms. The term "Consecutive," used by Vidal and some other authors, has been applied by Ricord to another class of symptoms, and to avoid confusion, should be abandoned as a synonyme of general syphilis.

GENERAL SYPHILIS ALWAYS FOLLOWS A CHANCRE.—In the immense majority of cases of acquired syphilis (excluding those of hereditary origin), general symptoms can clearly be traced to a preceding chancre. Thus of 826 patients with general syphilis who were treated at the Hôpital du Midi in 1856, the previous existence of a chancre in 815 was established beyond a doubt either by examination or by voluntary confession; in 9, there was strong reason to suspect it; and in the remaining 2, the disease was evidently due to hereditary taint. Of 267 cases of secondary syphilis observed by Fournier,[2] the same fact was proved in 265. Of 198 cases of syphilitic erythema under the care of Bassereau,[3] either a chancre or unquestionable traces of one were seen in 170; in 19, the patients confessed to the fact, although no evidence of it was found upon their persons; 4 acknowledged having had a gonorrhœa; 5 declared that they had had no preceding symptom. Thus we find

[1] See p. 396.
[2] De la Contagion Syphilitique, Paris, 1860, p. 15.
[3] Op. cit., p. 108.

that in a total of 1291 cases, general syphilis was undoubtedly preceded by a chancre in all except 22.

These statistics agree with the experience of all physicians, that, as an almost invariable rule, syphilis evidently originates in a chancre; and the small number of cases in which the existence of the ulcer cannot be established, renders it extremely probable that there are no exceptions to this law, especially when we take into account the following considerations:—

Chancres are capable of spontaneous cicatrization, and all traces of them may disappear in time, even without treatment.

They may occupy unusual situations, where their presence may readily escape notice, or be almost impossible to detect; among which the interior of the urethra, vagina, cervix uteri, and the buccal and rectal cavities deserve special mention.[1]

Exceptional cases almost invariably rest upon the testimony of patients alone; and are the more frequent, the later the lesion presented in the order of succession of syphilitic symptoms, in other words, the longer the time which must have elapsed since contagion took place. For instance, cases are rare in which a patient with syphilitic erythema does not confess that he has had a chancre; on the contrary, they are not infrequent when the general symptom is syphilitic rupia, tubercles, orchitis, or periostitis. This fact leads us to suspect that the defective memory of patients will explain some apparent exceptions to the rule.

From various motives, patients often conceal facts within their knowledge.

With perfect memory and unquestionable honesty, patients are incompetent witnesses upon subjects which involve medical knowledge, which they do not possess. The superficial chancre—the form which most frequently precedes general syphilis—is so indolent and so insignificant a sore, that it may readily pass unnoticed, or, if seen, be mistaken for a mere abrasion. I have met with several instances in which patients bearing this form of chancre in plain sight upon their persons, were entirely ignorant of its presence, or thought it of no consequence.

A chancre may be overlooked by the patient because seated elsewhere than upon the genitals—the exclusive seat of venereal ulcers in the estimation of the public—or may not be discovered, because concealed within the vagina, or beneath the prepuce when phymosis is present, or when the glans is never uncovered. In three instances,

[1] See p. 43, and also case upon p. 425.

married men have applied to me with chancres, and within four months their wives have exhibited the initiatory symptoms of general syphilis, without having noticed or suspected the presence of a chancre which undoubtedly existed, but which fear of exposing the husbands prevented my searching for. In other cases where an examination has been made, I have found chancres of which patients were entirely ignorant within the vagina.

Again, chancres are not unfrequent within the urethra beyond the reach of vision (see table on page 403), where an unprofessional person cannot be expected to be aware of their presence from the slight discharge, pain in micturition, and induration, which constitute their only symptoms, and which may be obscured by a coexisting gonorrhœa.

I repeat, therefore, that when we consider in how great a proportion of cases general symptoms are known to have been preceded by a chancre, and when we reflect upon the numerous sources of error attending the testimony of patients in apparently exceptional cases, it is infinitely probable that a law which is known to be commonly true, is in fact invariable, and that general syphilis always follows a chancre.

I would add that the admission of this truth is not inconsistent with the communicability of secondary symptoms, but, on the contrary, would favor it, provided that the latter are found by experience to give rise to a chancre by contagion; but of this more hereafter.

Period of Incubation.—The smallpox, hooping-cough, measles, scarlet fever, vaccinia, and other contagious diseases, have all a period of incubation preceding the outbreak of general symptoms, and confined within certain and definite limits; so that when, after exposure to one of these diseases, its period of latency passes by and the person exposed remains in perfect health, he may be pronounced beyond danger. Is it probable that syphilis is an exception to this law? Can it be true that, unlike all other contagious diseases, "the period of its latency is wholly uncertain and indefinite?" Only to those who refuse to watch the workings of nature untrammelled by art, or who rely upon the statements of unprofessional persons and not upon direct observation. Were it not for the abundant proof to the contrary to be found in many works upon venereal, no one would be likely to suspect the necessity of the remark, that the natural history of syphilis can only be learned from cases which are not influenced by treatment. Mercury is given for the very

object of preventing or at least retarding general symptoms, and if it have any effect at all, its administration vitiates the case for the purpose of observing the natural course of the disease. When left to itself, syphilis possesses as true, and nearly as definite a period of incubation as any other contagious disease; and the contrary opinion has arisen solely from the causes above stated.

In determining the duration of this period, we may take as a starting-point either the date of the infecting coitus or that of the appearance of the chancre. We shall presently see that some authors adopt one and some the other. The latter is perhaps preferable, because it can generally be ascertained by the surgeon with greater precision than the former. It would clearly be inadmissible to take as a starting-point the date of the cicatrization of the chancre, which is dependent upon many extraneous influences, and which is often subsequent to the outbreak of general manifestations.

Again, in order to obtain reliable results, it is essential that the termination as well as the commencement of this period should be ascertained with at least approximate accuracy; and this can rarely be done unless the patient be under the observation of some one who is familiar with the early general manifestations of syphilis. and who knows where to look for them and how to recognize them; since they are often so obscure as not to attract the attention of the patient himself. For instance, syphilitic erythema, which is one of the earliest secondary symptoms, is generally unattended by itching, and is often confined to the abdomen or perhaps to the flexures of the joints, so that the patient may be unaware of its presence until it is pointed out by the surgeon. The headache and general malaise, the post-cervical engorgement, alopecia, and *acne capitis*, which also appear at an early date, may likewise escape notice or not be recognized by ignorant persons. Taking these sources of error into account, it cannot be considered unfair to reject cases which rest solely upon the testimony of patients, when conflicting with the results of direct observation, and to adopt the latter as alone worthy of confidence.

The conditions, therefore, which should be required of any case or series of cases brought forward to determine the natural period of incubation of syphilis, are:—

1. That the date of the infecting coitus or of the appearance of the chancre should be known.

2. That the patients have not been subjected to treatment.

3. That they have been under the observation of some one competent to discover the earliest manifestation of general syphilis.

If these conditions be fulfilled, the analogy drawn from other contagious diseases leads us to expect, that although the period of incubation of syphilis may vary somewhat in persons of different constitution, or in those exposed to different hygienic or climatic influences, yet that it may be defined with a great degree of accuracy, and that the extremes of variation will not be far apart. Let us see how far these anticipations can be realized.

The first testimony which I shall adduce is that of Diday,[1] who has carefully fulfilled each of the above conditions in fifty-two cases. In all, the patients came under observation soon after the development of the chancre, the exact date of which to within a few days was invariably ascertained, and was taken as the commencement of the period of incubation. This surgeon rarely administers mercury for a chancre, but gives the patient a written statement of the time when general symptoms may be expected, of the situation they will probably occupy, the appearances they will present, and the necessity of his return for treatment. In none of these fifty-two cases, therefore, was the natural course of the disease interfered with; and in all, the very earliest indication of the invasion of general syphilis (in most instances, either headache accompanied by general malaise, engorgement of the sub-occipital ganglia, acne capitis, or an eruption upon the abdomen or arms) was observed by the surgeon himself.

The interval between the dates specified, viz., the appearance of the chancre and that of the earliest general symptom, was as follows:—

No. of Cases.	Interval in Days.	No. of Cases.	Interval in Days.
1	25	4	47
1	28	4	48
1	33	3	50
2	35	1	52
3	36	1	54
1	37	2	56
4	38	1	57
1	39	2	58
1	40	1	60
1	41	1	63
1	42	1	70
1	44	1	105
10	45	—	
2	46	Total, 52	

It appears from this table that the shortest period of incubation was 25 days, and the longest 105 days, but that the latter was 35

[1] Nouvelles Doctrines sur la Syphilis, p. 265.

days more than the one immediately preceding it. The extreme limits of variation are not widely separated (certainly not if compared with the variation from a few weeks to thirty years, which is given by some authors), and we find on examination that in by far the larger proportion of cases, the periods of incubation terminated within two weeks of each other; thus in 38 of the 52 cases, or in about four-fifths, this period was from 35 to 50 days. Taking the average of the whole number, it was 46 days.

Victor de Méric, Esq., Surgeon to the Royal Free Hospital, London, arrived at very nearly the same result from the observation of nine cases in which no treatment was administered. "In three cases of papules, the eruption in one appeared *seven weeks* after the primary symptom; in the other, the interval had been *six weeks;* and in the last, *eight weeks.* Two cases of roseola or efflorescence appeared, one, *twenty-four days* after the occurrence of the chancre, and the other, *one month.* Psoriasis appeared in two subjects at the distance of *four* and *eight weeks.* So that we may, regardless of the kind of eruption, reckon a mean of *six weeks* where no treatment has been resorted to."[1]

Bassereau was able to ascertain the *approximate* interval between *the infecting coitus* and the outbreak of syphilitic erythema ("one of the earliest manifestations of general syphilis") in 107 cases in which no treatment was administered, and has given the results in the following table:—[2]

Erythema	appeared	in from	20 to	30 days	in	. .	14	cases.
"	"	"	30 to	60	"	. .	66	"
"	"	"	60 to	90	"	. .	23	"
"	"	"	90 to	120	"	. .	3	"
"	"	in the course of the fifth month in				.	1	case.
						Total,	107	

Bassereau adds that the appearance of erythema for the first time as late as the fifth month is a very rare and exceptional occurrence. It should be observed that these statistics are less reliable than those of Diday, since many of the patients were not seen until some time after the appearance of the erythema, and their histories were obtained from their own statements.

Fournier,[3] from an examination of 307 cases, concludes that syphilitic erythema most frequently appears, in the absence of

[1] Lettsomian Lectures, 1858, p. 31. [2] Op. cit., p. 176.
[3] Notes to Ricord's Leçons sur le Chancre, 2d ed., p. 466

preventive treatment, between the fortieth and fiftieth day; and MacCarthy[1] states that the average is about seven weeks.

Until recently, I was in the habit of giving mercury for chancres, and can report but four cases in which patients have been under my care without treatment from the commencement of the sore until secondary symptoms appeared. In the following instances, however, taken from my note-book, various reasons induced me to defer treatment until the outbreak of general syphilis:

CASE 1. Chancre appeared Nov. 26, 1856, followed by general malaise, headache, pains about the joints, and papulæ in patches upon the forehead, Jan. 29, 1857. Period of latency, 64 days.

CASE 2. Chancre appeared April 2, 1857; syphilitic roseola May 12. Interval, 40 days.

CASE 3. Chancre first seen Jan. 1, 1859; mucous patches upon scrotum and internal surface of cheek, acne capitis, and post-cervical engorgement, Feb. 15. Interval, 45 days.

CASE 4. Chancre developed Feb. 2, 1859; syphilitic roseola appeared March 13. Interval, 40 days.

I have also met with frequent instances in which patients who had received no treatment, applied to me with early symptoms of general syphilis without being able to give the exact time of the appearance of the chancre, but it has invariably been stated that this occurred within the preceding three months.

Ricord, as the result of his extensive experience, enunciates the law that "when no specific treatment is administered for a chancre, and the disease is left to itself, six months never pass without the appearance of general symptoms;" and he adds, "in most cases, these supervene from the fourth to the sixth week; frequently during the second or third month; and very rarely as late as the fifth or sixth month." "M. Puche has verified the same fact in hundreds of cases, without meeting with a single exception."[2]

Prof. Sigmund, of Vienna, in order to determine the duration of the incubation of general syphilis, examined the notes of 1473 cases occurring in his own practice, and from these selected 293 as especially reliable, because copulation had occurred but once or only after a long interval, and because the primary sore had received no specific treatment. In none of these 293 cases did general symptoms fail to appear within three months. The chancre took on

[1] Thèse de Paris, 1844.

[2] RICORD, Lettres sur la Syphilis, 2d ed., p 300.

induration (reckoned by Sigmund among general symptoms) in 261; the lymphatic glands were affected in all, the fauces in 248; spots appeared on the skin in 204; and papulæ, pustules, and condylomata, either alone or combined, were present in 134. Sigmund, however, calls attention to the fact that the early symptoms of general syphilis may occasionally be so slightly marked or so obscure, that they will not be discovered or will not be recognized by incompetent persons; and it is only in such cases, he asserts, that the tardy appearance of late secondary and tertiary manifestations has given any semblance of truth to the assertion that the incubation of syphilis can be indefinitely prolonged. Sigmund lays down the rule, that when a chancre heals without induration, and when, no specific treatment being administered, secondary symptoms do not appear within the first three months, the patient has nothing farther to fear.[1]

Cazenave is the only author of any eminence whose statistical observations would appear to controvert the position which I have here advocated. This distinguished physician of the Saint Louis Hospital, founding his opinion upon only seven cases, estimates the average interval between contagion and the development of syphilitic erythema at nearly two years. In one instance, he states that it was ten years, but the syphilitic nature of the disease may well be doubted, since the patient was cured by a few simple vapor baths and barley water; and if this case be eliminated, the average duration will be much diminished. Moreover, Cazenave's position at a hospital for skin diseases, where patients are not seen until a long time after contagion, and where consequently the sources of error already referred to cannot well be avoided, detracts from the value of his observations, which cannot compare in number and importance with those of the observers before quoted. Bassereau,[2] who served as Interne both at the Hôpital des Vénériens and at the Hôpital Saint-Louis, states that syphilitic erythema was very common at the former, but that he met with only one case during his year's residence at the latter; and adds that this affection is not even mentioned in the work upon syphilitic eruptions by MM. Martins and Legendre, who collected their cases at the Saint-Louis, where they were internes with him. Thus we have direct proof that the above objection to Cazenave's testimony is not without foundation.

[1] British and For. Med.-Chir. Rev., Jan. 1857, from the Wien Wochenschrift, No. 18.

[2] Op. cit., p. 48.

Vidal[1] avoids expressing an opinion upon this subject, but refers with apparent approval to Cazenave's statement; and also adds, "M. Legendre, un des élèves les plus distingués de l'Hôpital Saint-Louis, auteur d'une thèse remarquable sur les syphilides, dit en propres termes: 'J'ai obtenu pour moyenne générale de l'intervalle de temps qui sépare les symptômes primitifs des syphilides (accidents secondaires) cinq ans, résultat absolument semblable à celui que M. Martins avait déjà consigné dans son mémoire.'" Unfortunately for the value of this testimony, which alone is quoted in full by Vidal, M. Legendre has since written a letter to Diday,[2] in which he states that the words in brackets ("accidents secondaires") are an interpolation; that his meaning has thus been misrepresented and made to support an untenable doctrine ("pour bâtir un point de doctrine insoutenable"); that his statistics include tertiary as well as secondary syphilitic eruptions; and that he "never intended to assert that my (his) patients had, on an average, passed five years without having syphilitic roseola, which is frequently overlooked, but which is none the less an evidence of the existence of the first stage of general infection of the system." I should not have referred to this error, had it not very naturally been reproduced in the American edition of Vidal on Venereal, and been copied into a recent work on "Gonorrhœa and Syphilis;" in both of which the liability of misleading the reader has been increased by interchanging the words "syphilides" and "accidents secondaires," and placing the former instead of the latter in brackets.

I have dwelt thus at length upon this question, not only on account of its scientific interest, but because it is one of great practical importance both to the patient and surgeon, and because I have desired to leave no doubt as to its correct solution. If it be true that the incubation of syphilis is "wholly uncertain and indefinite," the unfortunate individual who contracts a venereal ulcer, the nature of which is doubtful, can never feel secure for the rest of his days, nor be sure that his posterity will not inherit this great curse; but if, as I believe, it is of certain and definite duration, the lapse of a few months without the appearance of the disease will place the patient beyond danger. To the surgeon the conclusions at which we have arrived furnish the strongest inducement in all ulcers of a doubtful character to defer general treatment, and keep the patient under careful observation until secondary symptoms appear, or until the period of latency is passed in safety.

[1] Traité des Maladies Vénériennes, p. 261.

[2] Nouvelles Doctrines sur la Syph., p. 270.

To sum up this whole matter:—

A venereal ulcer which is not subjected to specific treatment (so called), *will generally, if at all, be followed by secondary symptoms within three, and always within six months.*

It follows as a corollary from this proposition and the one upon page 432, that

The earliest symptoms of general syphilis (except in cases of hereditary origin and of transmission through the fœtal circulation) *have been preceded by a chancre, probably within three, and certainly within six months,* provided mercury has not been given.

I will merely add that the development of general syphilis is hastened by an elevated temperature, and by those causes which tend to depress the vital powers, as excessive or prolonged exertion, or a dissipated course of life; and that it is, on the other hand, retarded by the contrary influences, and also by the supervention of an acute disease, as continued fever, inflammation of the lungs, etc. It also appears to be earlier in women, in whom mucous patches are developed with great rapidity, sometimes even three weeks after contagion.

SOME OF THE SYMPTOMS OF GENERAL SYPHILIS ARE CONTAGIOUS.—The older writers on syphilis fully believed in the contagiousness not only of secondary symptoms, but also of the sweat, saliva, semen, milk, blood, and even the breath of persons affected with general syphilis. Hunter, founding his opinion upon a few unsuccessful inoculations of secondary symptoms upon the persons bearing them, declared that the power of contagion was confined to the primary sore. Auto-inoculations, similar to those of Hunter, were repeated in thousands of instances by Ricord, and, in imitation of his example, by numerous surgeons in various parts of the world, the results of which were uniformly unsuccessful with scarcely an exception worthy of notice. On the other hand, the chancroid was regarded by Ricord and by the profession generally as the chancre type, and its secretion was found to be inoculable with the greatest facility. The inference which was drawn was a natural one, viz., that a radical distinction existed between primary and secondary lesions in the contagiousness of the former and the incommunicable character of the latter; and the zeal, energy, and ability with which this idea was for many years defended are known to the whole medical world.

The plausibility of this evidence, the immense number and uniform results of the experiments resorted to, the keen powers of

observation, ingenious reasoning, attractive manners, and evident sincerity of the Surgeon of the Hôpital du Midi, united in adding weight to a doctrine which had already been sanctioned by the great name of Hunter, and which was consequently for a time received as almost beyond dispute. Yet cases in apparent contradiction to Ricord's "law" were met with by many careful observers, especially in infants affected with hereditary syphilis, whose early age, incapacitating them from sexual intercourse, greatly diminished the chances of error of observation; and although instances of transmission of secondary symptoms from the nursling to the nurse, and vice versâ, were explained away with great ingenuity by Ricord and his adherents, yet they gradually came to be admitted by the majority of the profession. At the same time it was felt to be highly desirable to demonstrate this power of contagion by experimental inoculation, and thus place it beyond a doubt; and afterwards to study the phenomena of the process and compare them with those attending the evolution of general syphilis when originating in a chancre. Until this was done, the subject was likely to remain an open question.

This test, however, could not readily be applied. Ricord and his school—to their honor be it said—had confined their inoculations to persons already infected, and it was generally admitted that further experiments, in order to be decisive, must be made upon those who were free from syphilitic taint—a course which could not be justified in a moral point of view even for the purpose of advancing science. Wallace had already, in 1835, succeeded in inoculating the secretion of condylomata upon healthy individuals, but the want of precision in his observations rendered them of little value. Subsequent inoculations, however, within the last ten years, by Waller of Prague, Rinecker of Würzburg, a surgeon of the Palatinate who has concealed his name, Gibert and Vidal of Paris, and others, can leave no further doubt that the contagiousness of secondary symptoms can be demonstrated by the lancet.[1]

Gibert's experiments, although by no means the most conclusive that have been published, have probably attracted the most attention in this country, since they ostensibly formed the basis of a report in favor of the contagiousness of secondary syphilis, which was adopted by the Academy of Medicine of Paris, at its session of

[1] A resumé of the inoculations of Wallace and Waller may be found in the Arch. Gén. de Méd. for Feb., 1856; and of those of Rinecker and the anonymous surgeon of the Palatinate in the same journal for May, 1858. Vidal's experiments are given in his Treatise on Venereal.

May 31, 1859, and during the discussion of which Ricord gave in his qualified adhesion to the same doctrine. These cases are as follows:—

CASE 1. Patient No. 1, Saint-Charles ward; an adult affected with *lupus* of the face, which he had had since infancy. A vesicated surface was produced upon the left arm by aqua ammoniæ, and charpie soaked in the purulent secretion of *secondary mucous patches* situated around the anus was applied to the raw surface.

The patient from whom the matter was taken presented around the anus a corona of condylomata (*pustules plates*) which had already existed for a fortnight, and which were consecutive to a chancre of the prepuce contracted fifteen months before, the cicatrix of which was still apparent.

Jan. 30, 1859, five days after the inoculation, no trace of the latter was visible except the mark of the blister, which was about the size of a ten-cent piece. Nine days later all vestige of the blister had disappeared, but a little redness was seen at the same spot.

Feb. 12, the eighteenth day after the inoculation, a prominent copper-colored papule appeared.

Feb. 16 (the twenty-second day), a small quantity of serous exudation appeared on the surface of the papule, which in the meanwhile had spread and increased in size generally. This secretion becomes purulent, and forms by concretion a thin scab.

Feb. 23 (the twenty-ninth day), an enlarged gland is found in the corresponding axilla.

Feb. 26 (the thirty-second day), the scab is detached by a vapor bath, when a very superficial excoriation is found beneath it.

March 21 (fifty-fifth day), a superficial ulceration, slightly excavated, has formed in the centre of the papule, which has become more and more prominent and indurated, and now constitutes a true tubercle. Moreover, several blotches and reddish papules have appeared upon the body; subsequently they are transformed into pustules resembling acne, and this eruption becomes general upon the anterior surface of the upper extremities, upon the abdomen, internal surface of the thighs, inguinal regions, etc.

March 31, the patient is directed to take a mixture of the biniodide of mercury and iodide of potassium in syrup, and baths containing corrosive sublimate.

May 16, after six weeks' treatment the ulcerated tubercle upon the arm has disappeared, leaving behind it a white and slightly depressed cicatrix. The enlarged ganglia in the axilla remain. The general syphilitic eruption is beginning to disappear.

CASE 2. Patient No. 47, Saint-Charles ward. A vigorous adult,

affected with an inveterate papulo-tubercular lupus, which covers the whole face.

Several inoculations were made in the same manner and with the same matter as in the preceding case. Two of these succeeded and gave rise to the same local changes, but preceded by a longer period of incubation, which was a little less than twenty-five days. Slight redness then showed itself, followed by the development of a papule, which was at first dry, then became moist, excoriated, covered with a scab, indurated, and finally formed a true condyloma (*tubercule plat*). A ganglion in the axilla at the same time enlarged to the size of a hazel-nut. An eruption of roseola appeared upon the body on the fifth of March; that is to say, on the thirty-seventh day following the inoculation. Specific treatment was commenced a short time after; and on May 17 following, the cure appeared to be complete.

Case 3. This case presents a striking analogy with the two preceding, except that the papule was much smaller, and the tubercular induration was less marked, less extended, and underwent resolution more rapidly, leaving a rounded, superficial, and slightly fungous ulceration. Specific treatment was commenced before the appearance of the roseola. To-day (May 17) the patient is rapidly improving. The inoculation was performed Feb. 28, 1859. The matter employed was the viscous and plastic secretion from the papular surface of patient No. 1, whose local sore was at that time sixteen or seventeen days old.

Case 4. This case is more interesting in respect to the source from which the virus was taken (a scaly papule upon the *forehead*); the appearance of the matter itself (there was only bloody serum upon the lancet when withdrawn); the long duration of the incubation (about thirty-five days); and finally the form of the initial lesion, which, during its whole duration, presented no other appearance than that of a scaly papular surface, without secretion or excoriation.

The patient who furnished the matter for the inoculation had been treated by M. Puche, at the Hôpital du Midi, for an indurated chancre upon the external surface of the prepuce. At the time of his entrance into our wards (Feb. 7, 1859), this chancre had left in its place an indurated cicatrix, still a little red, in the form of a condyloma, and lenticular and indolent engorgement of the inguinal ganglia. Secondary mucous patches had been developed upon the penis, scrotum, the internal portions of the thighs, and anus, and had thence extended to other portions of the body. Upon the forehead was a large scaly patch, of a coppery red color, entirely dry, and about the size of a ten-cent piece.

Feb. 9, the point of a lancet was plunged into the circumference

of this patch, and charged with slightly serous blood, which was at once inoculated upon the palmar surface of the right forearm of a patient affected, like the preceding, with lupus of the face. As we had no idea that this inoculation would succeed, we allowed the patient, a fortnight after, to leave the hospital. All traces of the puncture had at that time entirely disappeared.

April 1st following, this young man re-entered the hospital under the care of M. Bazin. At this time (fifty days after the inoculation), we were surprised to find that there had been developed at the point of inoculation a reddish papule, which was spread out in an irregular form, entirely dry, and about the size of a ten-cent piece, and which thus resembled the scaly patch upon the forehead from which the virus was taken.

The patient reported that this patch appeared about fifteen days before, which was thirty-five days after the inoculation. Above and around it were seen several slightly prominent and coppery spots, the commencement of a squamous syphilitic eruption, which subsequently extended to other parts of the body. A painful ganglion, larger than a hazel-nut, was found in the corresponding axilla.

April 23, the patient's condition was as follows: blotches of roseola upon the body; a few scattered scaly papules upon the anterior surface of the upper extremities; an abundant eruption upon the scalp; engorgement of the posterior cervical ganglia; commencing mucous patches about the umbilicus and the margin of the anus; no symptoms about the mouth, throat, or genital organs.

Specific treatment was soon commenced, and by May 18th all the symptoms were much improved.

Gibert attempts to justify these inoculations on the ground that the patients were all affected with inveterate lupus of the face, which he hoped to benefit "by the double influence of a new constitutional disease and the specific remedies administered in its treatment;" and he has since stated that in three of the four cases this hope was realized and the patients entirely cured of their lupus;[1] this statement, however, requires confirmation, and the author has not escaped severe and just censure for inoculating syphilis upon persons who must have been ignorant of the risk they were incurring.

Looking at Gibert's cases from a purely scientific point of view, they are deficient in detail and in accuracy of observation, and could not be received in proof of the contagiousness of secondary syphilis, were the latter not sustained by clinical experience and the more

[1] Gaz. des Hôpitaux, No. 144, 1859, from the Gaz. Médicale.

reliable experiments of others. A sceptic in this doctrine would naturally say: "These cases prove nothing.—No exploration was made of the rectum of the patient from whom the matter was derived for the first two inoculations. This cavity may have concealed a chancre, the secretion of which was mingled with that of the mucous patch upon the margin of the anus.—Nor is it said that the patient bore any other evidences of constitutional infection. How do we know that the sore which he had upon the penis fifteen months before was not a chancroid, and that his supposed condyloma was not a recent chancre, undergoing a process of transformation into a mucous patch or tubercle, as often takes place during the reparative stage?—Owing to one or the other of these sources of error, which were not guarded against, the secretion of a primary instead of a secondary lesion was inoculated. No wonder a chancre was the result, the secretion of which was employed in the third successful inoculation.—The fourth case is vitiated by the absence of the patient from observation during thirty-five days between the inoculation and the outbreak of general symptoms; during which time he may have been exposed to many other sources of contagion."

These objections are not without foundation, and it is certainly not unfair to conclude that the Academy of Medicine did not rest its adoption of the report of its committee upon the experimental inoculations which it contained, but rather upon the large amount of evidence drawn from clinical experience which has for years been accumulating, and probably also upon the more reliable experiments of others, although the latter were not properly under discussion at the time. The conclusions of the report of the committee were as follows:—

1. Some *secondary* or general symptoms of syphilis are manifestly contagious. The mucous patch or tubercle holds the first rank in this respect.

2. This truth is applicable to persons in general as well as to the nurse and nursling; and there is no reason to suppose that the secretion of secondary symptoms in infants at the breast possesses different properties from those which are known to belong to secondary symptoms in adults.[1]

[1] The exact words of the original are as follows:—

1. Il y a des accidents *secondaires* ou constitutionnels de la syphilis manifestement contagieux. En tête de ces accidents, il faut placer la papule muqueuse ou tubercule plat.

2. Ce fait s'applique à la nourrice et au nourrisson comme aux autres sujets, et il n'y a aucune raison de supposer que chez les enfants à la mamelle le produit de ces accidents ait des propriétés differentes de celles qu'on lui connâit chez l'adulte.

The objections which I have brought against Gibert's inoculations, as recorded in his report, are well founded, and would justify a medical jury in pronouncing the verdict, "not proven;" but at the same time, considering the standing of their author and the concordance of the results with those of other observers, I have no doubt, in my own mind, that the matter employed was derived from the sources supposed. If this be so, the first two cases were instances of the successful inoculation of secondary symptoms. In the third (admitting with Rollet that secondary symptoms give rise to a chancre by contagion), the matter inoculated was that of primary syphilis. In the fourth (if the lesion upon the forehead be correctly described by Gibert), the *blood* of a syphilitic patient was successfully inoculated.

The interest attached to the decision of the Academy of Medicine, and to the occasion of Ricord's renunciation of a doctrine which he had so long and ably defended, is my reason for making Gibert's inoculations so prominent; but, as before stated, no one can for a moment suppose either from the character of the experiments or from reading the discussion before the Academy, that the event was anything more than the enunciation of a foregone conclusion. The contagiousness of secondary symptoms had already been proved by clinical experience, and its demonstration accomplished by the more carefully conducted experiments already referred to. Of the latter I shall only quote those reported by Rinecker, as entirely conclusive and sufficient in themselves to establish the point in question without the assistance of any others.

Case 1. A woman by the name of Bronner, aged 28, was admitted to the hospital in the fourth month of pregnancy, to be treated for general syphilis. Her symptoms were syphilitic acne, mucous patches and severe leucorrhœa, without any traces of primary symptoms. After a mercurial treatment she was dismissed, July 7, as cured. Nov. 17, she gave birth to a daughter, whom she was not able to nurse.

Her child appeared to be healthy at birth, but, on Dec. 9th, was attacked with sore mouth and diarrhœa, which yielded to the administration of nitrate of silver. On the 13th, large condylomata were found upon the genital organs and on the internal surface of the thigh. Soon after a specific eruption appeared upon the face, and this was soon accompanied by the most clearly marked symptoms of hereditary syphilis; such as an affection of the nails, syphilitic *nodus*, etc. The child grew thin and pale, and died Jan. 12, 1852.

A servant girl who took care of the infant during its illness, but

who did not nurse it, became affected; mucous tubercles were developed at the right angle of the mouth, and followed their usual course; the genital organs were examined with the greatest care, and found to be intact.

Prior to the death of the infant, a young physician, W. R., offered, for the interests of science, to allow himself to be inoculated with the secretion from the pustules of acne upon the child. He was 24 years old, of a robust and healthy aspect, had never had syphilis, and consequently was a very favorable subject for this experiment. Wallace's method was adopted with slight modifications; and Jan. 5, 1852, a blister three inches long by two inches wide was applied to his left arm; the serum was evacuated; and the matter from several pustules upon the child's forehead was introduced beneath the epidermis, which was not removed from the vesicated surface.

Jan. 10, there was no appreciable effect; the blister had followed its usual course, and, with the exception of slight redness and exfoliation, was completely healed.

Jan. 20, a short time after the healing of the blister, a papular eruption attended with severe pruritus, such as often follows the application of a blister, appeared over the whole arm, but disappeared without treatment.

Feb. 2. The result of the inoculation appeared very doubtful, when, on Jan. 25, the surface which had been blistered became red again, desquamated, and itched. At this date (Feb. 2), twenty-nine days after the inoculation, the surface is of a deep red and copper color, corresponding exactly to the limits of the blister. The skin is hard and infiltrated especially towards the circumference, and at the inferior and internal angle, where the matter employed in the inoculation was deposited in a larger quantity than elsewhere. In these portions are seen a number of papular elevations, from the size of a lentil to that of a pea, and firm. No pain.

Feb. 10. All the inoculated surface is covered with tubercles of a brownish-red color, hard to the touch, united in groups, and covered for the most part with scales. Those which first appeared bear upon their summits a dark scab, produced by an exudation of pus.

Feb. 15 (forty-two days after the inoculation), the isolated tubercles, especially those at the internal and inferior angle, have decidedly increased in size. They are now quite prominent, and are covered by a conical scab which reminds one of rupia, and beneath which suppuration has taken place. The skin is very much infiltrated, especially around the margins. There is a little pain following the lymphatic vessels. The axillary ganglia are swollen and tumefied.

We now attempt to make the eruption, which is thus far local, recede by means of frictions with an ointment containing the biniodide of mercury. This treatment at first appears to succeed; the

tubercles diminish in size; the infiltration begins to disappear, and in a fortnight the largest tubercles are the only ones remaining visible. The ointment is suspended for some time, when the local affection grows worse, and, March 14, seventy days after the inoculation, the skin again becomes red and more infiltrated. Still we do not despair of preventing general infection, and apply a paste consisting of equal parts of chloride of zinc and starch to the local sore. After the fall of the eschar, healthy granulations appear, and cicatrization progresses rapidly.

June 12 (one hundred and fifty days after the inoculation, and one hundred and thirty after the appearance of the local affection),[1] R——, who until this time had been quite well, complained of malaise, gastric disturbance and headache. A week later, an erysipelatous redness appeared upon the anterior wall of the soft palate, and a few days after a grayish-white exudation upon the same part, which was soon transformed into a superficial ulceration. A similar spot appeared upon the internal surface of the lower lip, and another upon the side of the frænum linguæ, and the occipital ganglia were slightly affected. Mucous patches appeared at a later date upon the scrotum.

Mercury internally and an appropriate regimen effected a cure in the course of a few weeks, and at the present time (Nov. 20), there have been no new symptoms.

I shall not quote in full Rinecker's second case, which is a mere continuation of the first, since the matter employed was taken from the tubercles upon the arm of R——, and, if we adopt the recent views of the nature of the sore produced by the contagion of general syphilis, it was, as in Gibert's third case, the secretion of a primary and not a secondary lesion which was inoculated. Suffice it to say, that matter from this source was applied in the same manner as in the former case, to the arm of another physician, Dr. Warnery, of Lausanne, Feb. 13th.

The phenomena which ensued were very similar to those in the preceding case. The blistered surface entirely healed, but, March 13th (twenty-three days after the inoculation), became red again, was infiltrated and thickened, and presented numerous firm, papular elevations, which, by March 21st, were transformed into prominent tubercles, covered with brownish scabs or thin grayish scales. An ointment of biniodide of mercury was used as in the former case, but about May 1st (from one hundred and sixteen to one hundred

[1] This long incubation of general syphilis was probably due to the mercurial frictions.

and twenty days after the inoculation, and from fifty-four to sixty days after the appearance of the local sore), Dr. W. was attacked with numerous and unquestionable symptoms of general syphilis, of which Rinecker gives a minute description.[2]

In discussing this question I have not considered it necessary to adduce proof from clinical experience in favor of the contagiousness of secondary lesions occurring in infants affected with hereditary syphilis, because examples of this kind abound in medical literature. The reader will find numerous instances recorded in Diday's work on Infantile Syphilis, a translation of which has recently been published by the New Sydenham Society. But let it not be forgotten that this is the most favorable field for the study of this question, since syphilitic infants almost invariably present secondary lesions upon the buccal mucous membrane, and the contact between the infant's mouth and the nurse's breast, is more frequent, prolonged, and intimate, than often occurs between any two surfaces in adults equally liable to be affected by general syphilitic lesions.

Moreover, cases of transmission of secondary symptoms between grown persons are almost always open to the suspicion that the disease was contracted in some other way. A number of cases, however, of undoubted character, have been reported by Rollet,[1] and others, thus disproving Diday's former idea, that hereditary syphilis possesses a peculiar virulence, and is alone capable of being communicated by contagion. In the first of Rollet's cases, the disease was transmitted from the mouth to the breast, in the same manner as commonly occurs in infants.

Case 1. Mme. X—— was delivered of a healthy female infant, Oct. 30, 1856. As the child did not readily take the breast, a woman was engaged to come to the house every day, and draw off the milk. By the month of Jan., 1857, a fissure had formed upon the nipple, attended with engorgement of the axillary ganglia, but had finally healed.

The patient was under the care of Dr. Despiney, who afterwards discovered unmistakable signs of general syphilis, but, fully persuaded of her virtue and that of her husband, suspected that he was mistaken in his diagnosis, and, the following May, referred her to Rollet, who found that she had syphilitic erythema, alopecia, scabs upon the head, engorgement of the suboccipital ganglia, mucous patches upon the mouth, grayish spots upon the tonsils, but no lesion of the genital

[1] These two cases were originally reported to the Physico-Medical Society of Würzburg, and are inserted in the third volume of their Transactions.

[2] Archives Gén. de Méd., March, 1859.

organs. These symptoms had existed for a fortnight. Her husband was perfectly well, and had never had any venereal trouble.

Rollet, with considerable difficulty, ascertained the above mentioned particulars with regard to her milk having been drawn off, and, on examining her breasts, found at the base of the left nipple a large characteristic induration, and two glands of the size of a nut, not painful, in the axilla.

It was learned on inquiry that the woman who had sucked the breasts, was virtuous, but had had syphilitic lesions upon the genital organs, which were communicated by her husband, and which had healed without treatment. She had afterwards had mucous patches upon the fauces, and at the same time with her attendance upon Mme. X——.

The infant was now examined and found affected with an ulceration of the lip, which disappeared under a mercurial course that was at once commenced. It, however, afterwards had mucous patches around the anus and the genital organs.

The mother was cured for a time of her symptoms, but had several relapses. The husband never presented any syphilitic lesion.

Case 2. Jules C——, silk-weaver, aged 25, entered the Antiquaille Hospital, Lyons, June 26, 1858. He had never had any venereal disease until April 11 preceding, when he was bitten upon the upper lip by Louis B., and the wounds produced by the aggressor's teeth remained open for two months.

At his entrance into the hospital, two masses of induration were found in the upper lip; each of which nearly equalled in size a twenty-five cent piece, and was slightly excoriated upon the surface. The submaxillary glands on each side were enlarged and indolent.

He had had for several days scabs upon the head, alopecia, erythema upon the body, and mucous patches upon the scrotum; nothing upon the penis. He was ordered to take pills of the protiodide of mercury, and baths containing corrosive sublimate, and left the hospital July 8, before he was quite well.

His wife presented no trace of syphilis, and was nursing at the time a healthy infant.

Louis B——, who bit him, and who was condemned for the act to six months' imprisonment, had been treated for general syphilitic symptoms at the hospital which he entered April 10, 1857, when, as shown by the records, he had an indurated chancre of the corona glandis, which healed at the end of three weeks. He afterwards had mucous patches upon the scrotum, engorgement of the posterior cervical ganglia, and alopecia; for which he remained under treatment until May 8, when he left the hospital.

At the time when he seized Jules C. between his teeth, he had

syphilitic lesions in the mouth, and told the latter as he bit him that he would give him the pox.

Case 3. Antoine S——, aged 20, contracted an indurated chancre upon the penis in April, 1858, which, after existing for some time, healed without treatment. He afterwards had a papular syphilitic eruption, sore throat, and excoriated patches upon the mucous membrane of the lips.

He was examined by Rollet, Dec. 15, 1858, when he presented the following symptoms: A large, cartilaginous, and pathognomonic induration, half of which was upon the glans penis, and half upon the prepuce towards the left side; well-marked multiple adenitis in the left groin; a mucous patch at the left commissure of the lips; traces of an eruption upon the legs and thighs.

S. was a worker in a glass-foundry, where it is the custom among the men who blow the bottles to work by threes; the first blows the glass into a hollow globe, and passes the tube to the second, who modifies the form in some way, and he to the third, who finishes the bottle. S. was the first of a set who blew in the same tube.

John J——, aged 21, the second of the same set, perceived, in October, 1858, a hard lump, the size of a cherry-stone, on the anterior and right side of the lower lip, and a short time afterwards the sub-maxillary ganglia, especially on the right side, became engorged. At a later date, which the patient could not state with accuracy, an ulceration with a grayish floor appeared on the right tonsil and on the anterior wall of the palate.

The patient was examined Dec. 10, 1858, when a reddish and indurated patch was found at the spot already mentioned upon the lip; there was multiple sub-maxillary adenitis; an ulceration upon the right tonsil; nothing whatever upon the genital organs.

Fleury G——, aged 42, was the third of this set of glassblowers. He was examined Dec. 10, 1858, and presented several ulcerations, which he said had existed about a month. One was situated upon the mucous membrane of the lower lip near the median line; its floor was reddish and raw, and partly covered with a blackish scab; its edges irregularly cut; its diameter nearly half an inch.

A second ulceration was seated upon the internal surface of the upper lip; its floor grayish and pultaceous; its edges sharply cut; its depth less than the preceding.

A third ulcer also occupied the upper lip; it was grayish, of small extent, and would perhaps admit the head of a pin.

On examining the mouth, a mucous patch was found between the uvula and the left posterior pillar of the palate; the fauces were generally red, and the patient experienced difficulty in swallowing. The sub-maxillary ganglia were sensibly engorged, and also to a less

degree those upon the side of the neck. G. has no lesions of the genital organs. He is married and the father of a family. His children are all well, but he states that he has communicated the disease to his wife, who, however, could not be examined.

CASE 4. M. X——, aged 25, of a good constitution, consulted Rollet in April, 1849, for an indurated chancre of the prepuce, which completely healed after three weeks' treatment.

In the month of Aug., the patient presented symptoms of general syphilis; scabs upon the head, alopecia, engorgement of the sub-occipital ganglia, erythema of the fauces with superficial ulceration of the tonsils, mucous patches upon the sides of the tongue, a papular eruption upon the body and extremities, and mucous patches around the anus. Antisyphilitic treatment was again administered, under which all the symptoms disappeared, with the exception of the mucous patches in the mouth, for which the patient refused to continue treatment.

In September, 1850, Rollet was called to a family in which M. X. was quite intimate, and found a girl aged 18, who presented upon the lower lip a prominent patch, of a circular form, grayish at the centre, and apparently covered with a false membrane; a similar but smaller patch was visible upon the corresponding part of the upper lip, and the sub-maxillary glands were engorged. The diagnosis was not at this time made out, although an ointment containing calomel was prescribed.

Six weeks afterwards, the affection of the lips was nearly in the same condition, but other symptoms had supervened which left no doubt as to the nature of the disease. These were: mucous patches upon the sides of the tongue; erythematous inflammation of the fauces; a pustular eruption upon the scalp; lesions upon the vulva which her mother said resembled the mucous patches in the mouth. An antisyphilitic treatment was now commenced.

As soon as Rollet recognized the syphilitic nature of the disease in the girl, he suspected M. X., whom he knew to be still affected with mucous patches of the mouth; and upon telling him his suspicions, he confessed that he had been in the habit of kissing her and had given her the disease in this manner. M. X. also stated that he had had sexual relations with another woman, whom he requested Rollet to visit lest he might have also infected her. Rollet did so, and found that she had an ulcerated patch upon the lower lip. She had recently become pregnant, and subsequently miscarried and exhibited unequivocal symptoms of general syphilis.

CASE 5. One of the most esteemed druggists at Lyons, requested Rollet to visit Mrs. X., a woman of irreproachable character, but in whom the druggist thought that he recognized symptoms of syphilis.

The patient was 22 years old; of a lymphatic temperament; had been married three years, but had had no children. She was first seen by Rollet in April, 1857, in the presence of her mother.

Three months before, this woman first perceived upon her lower lip an ulcer, which she supposed was a mere crack or fissure. It had gradually been enlarging, and the sub-maxillary ganglia had become indurated. About a month before, scabs had appeared upon the head, together with alopecia, sore throat, and a general eruption upon the body.

When seen by Rollet, there was well-marked elastic induration of the lower lip; the sub-maxillary ganglia were swollen and slightly painful; the whole body was covered with a papulo-vesicular eruption. Erythematous inflammation of the fauces, pain in deglutition, engorgement of the sub-occipital ganglia, coryza and alopecia were also present. The genital organs were sound.

There could be no doubt of the nature of the disease; but, before expressing an opinion, Rollet requested the mother to retire, and then told his patient that she had syphilis, and asked her if she wished it to be kept secret. She did not hesitate a moment, but desired her mother called in again, in whose presence the subject of the origin of the infection was discussed. Neither the wife nor mother accused the husband, who was a man of very regular habits; and both expressed a wish that he should be present at the second examination.

The husband was 35 years old, of a good constitution, and confessed that he had had syphilis at the age of 22, which had been perfectly cured at the Strasbourg Hospital. He had had no subsequent symptoms, and, upon examination, was found to be perfectly sound.

Finding that the husband did not accuse the wife, nor the wife the husband, that there was no attempt whatever at concealment, and taking into consideration that the first symptom had been a chancre upon the lip, Rollet, after a long examination and inquiry, became convinced that his patient had derived her disease from her cook, who was found to have a copious eruption of mucous patches upon the fauces, a pustular eruption upon the scalp, alopecia, and other unequivocal syphilitic symptoms; and both she and her mistress were in the habit of tasting out of the same spoon the dishes prepared for the table.

Rollet relates a number of other, and no less remarkable instances of the transmission of secondary syphilis between adults, all of which, considering the high standing of their author, are entitled to confidence. Fournier[1] also gives the details of four cases, in which

[1] De la Contagion Syphilitique, Paris, 1860, p. 77.

indurated chancres were undoubtedly produced by contagion from mucous patches or secondary ulcerations in adults affected with acquired syphilis.

Dr. Samuel S. Purple, of New York, has also related to me several instances in which there could be no reasonable doubt that syphilis was communicated by young men affected with mucous patches of the mouth to young women to whom they were engaged.

But in spite of the immense amount of evidence in proof of the contagiousness of general lesions (but a small portion of which has here been given), it may well be doubted whether this question could be regarded as satisfactory and definitely settled, were it not for the recent investigations relative to the chancrous and chancroidal poisons and the properties of the true chancre, which have removed all obstacles to the admission of this doctrine, and have thus furnished another beautiful instance in the history of science of the light thrown upon one subject by the study of another. So long as the two species of venereal ulcers were confounded, and the chancroid was regarded as the chancre-type, it was impossible not to believe that a radical distinction existed between primary and secondary lesions, and that the former were inoculable and the latter not inoculable upon persons bearing them; and it was highly probable, also, that as the properties of the one were known to be the same in respect to healthy individuals, those of the other were so also. But since the discovery that the chancre alone pertains to true syphilis, and that it is not auto-inoculable, the same mode of reasoning, independently of direct proof, leads to the conclusion that the properties of primary and secondary syphilitic lesions, in respect to contagion, are exactly the reverse in infected and healthy persons.

The contagion of syphilis in its primary as well as secondary forms is now known to coincide with that of other infectious diseases, all of which are innocuous to persons already under their influence, but virulent to those who have never been affected by them; and while, in considering this subject, we cannot but be struck with the beautiful harmony of nature in disease, we may well feel humble at the thought that so plain a lesson from analogy should for so long a time have been disregarded.

Repeated inoculations of the secretion of secondary symptoms, and, in one instance, of a chancre, performed by Diday, Rodet, and Rollet, upon persons afflicted with cancer have invariably failed, whence it has been supposed that an antagonism exists between the cancerous diathesis and syphilis.[1]

[1] DIDAY, Histoire Naturelle de la Syphilis, p. 52.

What General Symptoms are Contagious?—By far the larger number of successful inoculations of general symptoms have been performed with matter taken from mucous patches, condylomata, or superficial ulcerations of mucous membranes, all of which lesions may be regarded as essentially the same or nearly identical; and, so far as I have been able to ascertain, all cases of contagion from general symptoms which have been observed in practice have been produced by matter from the same class of sores.

In Rinecker's first case, the matter was derived from syphilitic acne, and Vidal has inoculated with success the contents of the pustules of ecthyma. Blood was used in one of Waller's cases. The same fluid was employed in nine inoculations by the anonymous surgeon of the Palatinate, three of which were successful; and it is almost certain, I think, that this was also the active agent in Gibert's fourth case.

The great frequency of mucous patches upon those parts of the body (the vulva in women, and the mouth in both sexes, especially in infants), which are most exposed to contact with other persons, explains why such lesions should be the most common source of contagion among general manifestations. The artificial inoculations of Vidal and Rinecker prove that pustular syphilitic eruptions are also contagious; and it is highly probable that the same property is possessed by all general symptoms which are attended by a serous or purulent secretion; but it is difficult to believe that any of the dry forms of the disease, without the presence of fluid capable of absorption, are communicable.

The contagiousness of the blood of syphilitic persons—if merely, as is probable, in a slight degree only—is a fact of great importance, which is sustained by a large amount of evidence drawn from the communicability of other contagious diseases by means of the circulating fluid,[1] and demonstrated by the five cases of successful inoculation already referred to. It is, indeed, true that repeated attempts by other surgeons to inoculate this fluid have failed; for instance, eighteen inoculations performed by Diday (16 in June, 1848, and 2 in September, 1849) were all unsuccessful; but in a matter of this kind a few well-conducted cases of success are of greater weight than many failures.

Waller's inoculation was performed upon a boy aged 15, who had never had syphilis. From three to four drachms of blood were taken

[1] A resumé of this evidence may be found in an admirable paper by Dr. Viennois on the Transmission of Syphilis by Vaccination, published in the Arch. Gén. de Méd. for June, 1860.

from a patient affected with secondary syphilis, and applied to the cuts produced by the application of a scarificator. At the end of three days, the wounds had entirely healed, but, thirty-four days after the inoculation, two distinct tubercles appeared, which finally coalesced and ulcerated. Sixty-five days after the inoculation, and thirty-two days after the appearance of the tubercles, a well-marked syphilitic roseola was developed upon the abdomen, back, chest, and thighs. The whole body became covered with the eruption, and some of the blotches upon the thighs were transformed into papulæ. The diagnosis was confirmed by a number of competent physicians who saw the case.

The most recent experimental inoculations of the blood, and probably the most decisive (since performed in public with the utmost care), are those of Dr. Pellizari, Clinical Prof. of Venereal Diseases at the Ecole Pratique of Florence. Two inoculations upon young physicians, performed Jan. 23, 1860, failed, the subjects remaining well two years afterwards. Feb. 6, 1862, however, three other students offered to repeat the experiment. A portion of the integument upon the upper portion of the arm of each of them was denuded of epidermis by means of a scalpel, three transverse incisions made upon it, and charpie soaked in the blood drawn from the cephalic vein of a woman in the secondary stage of syphilis, was bound upon the part. Two of these inoculations failed; one succeeded. In the latter, upon the surface to which the blood was applied, a papule appeared on the 25th day, remained dry for a time, and became moist and excoriated on the 8th day of its existence. Engorgement of the axillary ganglia supervened on the 11th day; premonitory fever with post-cervical engorgement on the 33d; and syphilitic roseola on the 41st day after the appearance of the initial lesion.[1]

In the experimental inoculations of the blood by the surgeon of the Palatinate, it is stated that those only succeeded in which the fluid was applied to an extensive absorbing surface, which was made raw by friction.[2]

Dr. Viennois has adduced satisfactory evidence to show that many instances of the transmission of syphilis by vaccination are due to the lancet having been charged with blood taken from syphilitic persons. No opportunity will be more convenient than the present to state the following results at which this author has arrived from his thorough and exhaustive researches relative to the connection between vaccination and the transmission of syphilis; and I regret

[1] See L'Union Médicale, No. 52, 1862.

[2] Revue Critique, par le Dr. Lasègue, Arch. Gén. de Méd., May, 1858, p. 6

that my space will not permit a fuller notice of his investigations, for which I must refer the reader to the original paper in the Archives Générales de Médecine for June, 1860.

1. Vaccination with pure vaccine matter is sometimes the exciting cause of the appearance of a syphilitic eruption in infants already under the syphilitic diathesis; in the same manner that it gives rise to non-specific eruptions in strumous subjects. The history of the case and the order of evolution of the symptoms are generally sufficient to establish the diagnosis. For instance, the appearance of the eruption within a few days or weeks after the vaccination, without the ordinary period of incubation of syphilis, will render it probable that the disease was already latent in the system.

2. Syphilis cannot be transmitted to a healthy person by the inoculation of vaccine matter taken from a syphilitic subject, unless the lancet at the same time be charged with blood; in which case a chancre is produced followed by general symptoms in their usual order of evolution.

Two remarkable instances of the transmission of syphilis by vaccination are reported by M. Lecoq.[1] By far the most important and interesting series of cases, however, occurred recently at Rivalta, Italy, in which forty-six out of sixty-three children who were vaccinated became syphilitic and transmitted the disease to nurses, mothers, fathers, brothers and sisters, making a total of eighty persons. In these cases, also, blood is said to have been drawn with the lymph from the arm of the first vaccinifer, and the initial lesions in those who received the poison, were indurated ulcers (chancres) which were preceded by a period of incubation averaging twenty days.[2]

Numerous instances of a similar character, in some of which the disease spread to a large number of persons, have been collected by M. Viennois, and are sufficient to show that although vaccination is commonly a harmless operation, yet that it may, if proper precautions be omitted, be the means of transmitting a fearful constitutional disease.

Admitting the contagiousness of the blood of syphilitic persons, we might from *à priori* reasoning suppose that the various fluids which are secreted from the blood, as the saliva, milk, sweat, and semen, are also contagious, and this was the belief of the earlier writers on syphilis. At the present day, however, we find but few advocates of the contagiousness of any of the secretions mentioned

[1] Guyenot, Thèse de Paris, 1859. See also Gazette Hebdomadaire, 27 Janv. 1860.

[2] For an able resumé of these cases, see Mr. Henry Lee's Lectures on Syphilitic Inoculation and its Relations to Vaccination, London Lancet, 1862.

except the milk and semen, and the latter alone will at present occupy our attention.

It is an established fact that the seminal fluid of a syphilitic father may infect an ovum in the womb of a healthy mother, who may herself be contaminated through the fœtal circulation; but the question at issue is whether a woman, without becoming pregnant, may contract syphilis by cohabitation with a man affected with this disease, but who at the time presents no syphilitic lesion; in other words, whether the semen possesses the same contagious properties that are known to exist in the secretions of primary and secondary lesions, and in the blood. Now the supposition that this is possible is not at all unreasonable, but it is an axiom in the study of the natural sciences that nothing should be admitted as true which is not susceptible of demonstration, or which is not supported by the strongest analogy, and if we receive as a fact that which is merely not improbable, we at once open the door to error; moreover, now that the contagiousness of syphilis is known not to be confined to the primary sore, we must carefully guard against the reactive tendency which will probably follow to extend its limits beyond the bounds of truth.

It should be required of all cases adduced for the purpose of proving the contagiousness of the semen, that the fact should be well established that the man had no syphilitic lesion at the time of intercourse; that the woman was not otherwise exposed, and did not become pregnant; and that the evolution of her syphilitic symptoms coincided with that which invariably follows contagion from other sources; hence that a primary sore appeared at the point where the virus entered the system, and that general symptoms ensued in their usual order, and after their usual period of incubation, as after the transmission of the disease by the secretion of a primary or secondary symptom, or by the blood; and I do not hesitate to say that these conditions have never been fulfilled in a single instance.

SYPHILIS PURSUES ESSENTIALLY THE SAME COURSE, WHETHER DERIVED FROM A PRIMARY OR SECONDARY SYMPTOM; IN THE LATTER CASE, AS IN THE FORMER, THE INITIAL LESION IS A CHANCRE.—At a discussion before the Société Médicale du Panthéon, of Paris, in 1856, relative to the contagiousness of secondary symptoms, Dr. Edward Langlebert stated his suspicions, founded upon two cases of secondary contagion which had come under his observation, that

the initial lesion was a chancre.[1] This idea, at first advanced without any adequate proof, excited but little attention, until, in 1858, it was taken up anew by a distinguished surgeon of Lyons, M. Rollet, who subjected it to the test of comparison with a large number of cases of secondary contagion which were to be found in medical literature, adduced additional facts from his own experience in its favor, and, in short, was able to sustain it by such an amount of evidence, that there could remain but little doubt of its truth. Judging from my own impressions, upon first reading Rollet's conclusions, which were published in the *Archives Générales de Médecine*, for February, March, and April, 1859, they will appear to one who has never heard of them before, as novel and ingenious, but not entirely satisfactory; but they certainly grow in favor the more they are thought of; and, above all, the more closely they are compared with those cases of secondary contagion which have been published without any preconceived notions as to the phenomena which would ensue, the more reasonable and reliable do they appear. I would recommend the reader to peruse again the cases of transmission of syphilis from secondary lesions and the blood, which have been quoted in the present chapter, at the same time bearing in mind the evolution of the disease when following contagion from a primary sore, and he cannot fail to observe the great similarity between them; in fact, so slight is the difference as to constitute no serious objection to the doctrine of MM. Langlebert and Rollet.

It may be remarked at the outset that this doctrine is supported by analogy. All other contagious diseases follow the same course, whether the disease from which they were contracted was, at the time of contagion, in its commencement or near its termination. If one person communicate variola, scarlet fever, or measles to another, the symptoms in the latter do not exhibit any essential difference in consequence of the early or late stage of the affection existing in the former at the period of communication. A slight difference in the time occupied by the vaccine pustule in reaching maturity in vaccinations with the fresh lymph and those with the dry scab has been noticed, but no variation in the symptoms has ever been detected. Hence we may reasonably suppose that syphilis will also pursue the same course, whether derived from a primary or secondary lesion; but, after all, this is a question which must be decided by an appeal to facts.

In submitting this doctrine to the test of experience, I propose to

[1] Proceedings of the above society for 1856, p. 8. See also a letter from M. Langlebert to M. Diday, Gaz. Méd. de Lyon, July 1, 1859.

compare in general the phenomena following contagion from each of these two sources, but to pay particular attention to the initial lesions, with regard to which there is most likely to be a diversity of opinion. It will be well, therefore, in the first place to inquire what constitutes a chancre.

I have elsewhere defined a chancre "the initiatory lesion of acquired syphilis, arising at the point where the virus enters the system, and separated from the general manifestations of constitutional infection by a period of incubation." The essentials of a chancre, then, as I understand them, are, a sore developed at the point of contagion as the earliest symptom of acquired syphilis, the appearance of which is followed by a period of latency as regards the virus, and subsequently by general syphilis. We shall presently see that if this definition be received as correct, there can be no hesitation in admitting that the initial lesion of syphilis from secondary contagion is a chancre.

But there are minor conditions which enter into our ideas of a chancre (as at present understood), and which are as follows: a period of incubation between contagion and the appearance of the sore; ulceration varying in extent and depth, but which may involve only the epidermis or epithelium; and, in the great majority of cases, induration of the base of the sore and of the neighboring lymphatic ganglia. It is only with respect to a few of these points that any doubt is admissible as to the identity of the chancre following primary and that produced by secondary contagion.

With these preliminary remarks I proceed to a comparison of the phenomena in the two cases.

1. *The earliest symptom following secondary (as in cases of primary) contagion is a sore developed at the point where the virus enters the system.*—Artificial inoculations, to which we can alone refer for the establishment of this fact, prove it to be true without exception.

2. *This sore is preceded by a period of incubation, like the ordinary chancre.*—In all cases of artificial inoculation of secondary symptoms and of the blood, the inoculated point has remained quiescent for a number of days before the appearance of the initial lesion. In twelve cases collected by Rollet, this period was 29, 27, 35, 9, 33, 27, 15, 42, 28, 17, 25, and 34 days respectively, which give a minimum of 9 days, a maximum of 42 days, and a mean of 26 days.[1] This average is somewhat greater than that of the ordinary chancre, as deduced from clinical experience;[2] but if, as Rollet claims ought to be done, we compare artificial inoculations with artificial inoculations,

[1] Gaz. Méd. de Lyon, Dec. 16, 1859, p. 567. [2] See p. 404.

we find that the difference is very small. Thus, in Rinecker's inoculation of a chancre, the interval was 25 days; in Gibert's, 24 days; and in Rollet's, 18 days; making an average of 22 days.

3. *It is generally a papule, which in most cases becomes ulcerated and indurated, and is attended by engorgement of the neighboring lymphatic ganglia, and hence closely resembles a frequent form of the ordinary chancre.* — I must recall to the mind of the reader the fact that the chancre-type, as formerly received, originating in a pustule and consisting of an excavated ulcer with sharply-cut edges, is now known to belong to the chancroid; and that, as proved by the observations of Bassereau and others, a chancre is most frequently a superficial erosion, not extending beyond the epidermis or epithelium, and which, in many cases, becomes papular, and is elevated above the surrounding surface; in a small proportion of cases only does it involve the whole thickness of the integument or mucous membrane.

In nearly all the reported cases of syphilis following the inoculation of a secondary symptom, the initial lesion is said to have been a papule, which was gradually developed into a tubercle, and (sometimes after an interval of several days) took on superficial ulceration, which, if not explicitly mentioned, is indicated by the description of such a scab as could only be formed by the desiccation of lymph or pus. In one instance only—Gibert's fourth inoculation—do we find that there was no abrasion of the surface during the whole duration of the papule. Diday also refers to a case of secondary contagion from an infant to a nurse, in which a papular elevation upon the breast, which was followed by general syphilis, did not at any time ulcerate in the slightest degree.[1]

In the two cases of contagion from inoculation of the blood in performing vaccination, reported by M. Lecoq, the initial lesions were excavated ulcers, presenting exactly the same appearance as the so-called Hunterian chancre.

Induration of the base of the sore and engorgement of the neighboring lymphatic ganglia, those two important symptoms of a chancre, have been found in most of the initial lesions of syphilis from secondary symptoms, whether the result of artificial inoculation or infection by contact. Invariable constancy could not be expected, when they are transitory or absent even in some cases of primary sore. It should also be remembered that most artificial inoculations have been performed without any suspicion that a chancre would be developed, and generally by persons who attached but little

[1] Traité de la Syphilis des Nouveau-nés, Paris, 1854, p. 295.

importance to induration, and who may therefore have overlooked it in cases in which it is not noted. If aware of its importance they would have distinctly mentioned its absence. Wallace's and Waller's cases are somewhat imperfectly reported, and yet we find induration of the initial lesion spoken of in two of the three cases pertaining to the former, and in one of the two cases of the latter. Each of these symptoms was present in Rinecker's, and in both of Lecoq's cases. Of Gibert's three inoculations of secondary lesions and of the blood, the initial sore was indurated in two, and in the third, the patient was absent from observation at the usual time for its development; the neighboring ganglia were engorged in all. I have not been able to refer to a full account of the cases reported by the surgeon of the Palatinate.

The testimony of those cases of secondary contagion not artificially inoculated, which have been observed in practice, is still more conclusive. In those occurring in adults, recorded by Rollet and Fournier, induration of the base of the sore (with one exception) and engorgement of the ganglia were present in all, and as fully developed as in the most perfect chancre. Induration of the axillary ganglia in nurses infected by syphilitic infants attracted attention many years ago. Diday says: "Nothing is more common than to see engorgement of the glands of the axilla in women contaminated through the medium of the breast. Mahon[1] observed this fact, and laid it down as a general rule, which has proved true in the majority of cases which have come under my observation."[2] The same fact is noticed by Bosquillon[3] and other writers on infantile syphilis.

4. *The period of incubation of general symptoms is nearly the same whether the disease be derived from a primary or secondary lesion.*— In the twelve cases collected by Rollet, this second incubation of the virus was 37, 26, 92, 42, 31, 128, 26, 107, 48, 37, 12, and 38 days respectively; making an average of 52 days, which will be reduced

[1] Histoire de la Médecine Clinique, suivie d'un Mémoire sur la Nature et la Communication des Maladies Vénériennes des Femmes enceintes, des Enfans et des Nourrices. Paris, 1804, p. 440.

[2] Traité de la Syphilis des Nouveau-nés, p. 293. Diday proceeds to say that this engorgement by no means proves that the lesion upon which it depends is a primary chancre. This was written, however, before Rollet's doctrine was known, and Diday has since modified his opinion, as appears from the following quotation of his words in a recent discussion before the Imperial Society of Medicine of Lyons, Feb. 20, 1860: "Quel est donc la nature de cet accident initial? C'est un chancre, *je l'admets;* mais un chancre à caractères effacés, mitigés, atténuès." (*Gaz. Méd. de Lyon*, No. 8, 1860, p. 209.

[3] French translation of Bell on Venereal, vol. ii., p. 620, as quoted by Fournier.

to 45 days, if the case be omitted in which the interval between the appearance of the chancre and that of general symptoms was 128 days, and in which mercury was administered. It will be recollected that Diday's accurate investigations relative to the duration of the same period after contagion from a primary sore give a mean of 46 days — a correspondence with the average duration after contagion from a secondary lesion, which is truly remarkable.

5. *The earliest general symptoms are of the same character after contagion from a secondary as from a primary lesion.*—The truth of this proposition is evident upon examination of the cases which I have quoted, and in which the earliest general symptoms have been mucous patches, an erythematous or papular eruption, acne capitis, alopecia, post-cervical engorgement, etc., as after contagion from a primary sore.

In reviewing the above comparison we find a general correspondence between the phenomena following contagion from primary and from secondary symptoms. In the latter the period of incubation preceding the appearance of the initial lesion is perhaps longer than in the former, but our statistics are yet too meagre to render it absolutely certain, and a difference in this respect cannot at any rate be considered of much importance.

The greatest difficulty lies in reconciling the aspect of the initial sores in the two cases; for even with the modification of our views as to the characteristics of the chancre-type brought about by modern investigations, it must be confessed that the earliest lesion following secondary contagion differs in some respects from that which appears after primary; it is more frequently papular, is generally slow in taking on ulceration, and, in a few instances—if the statements of observers can be implicitly believed—is not moistened by the slightest secretion during its whole existence. Diday[1] and Langlebert,[2] in fact, admit a distinction in the appearance of the chancre according as it originates in one or the other of these two modes, and state that when derived from a secondary lesion it is a superficial erosion, but if from a primary lesion that it is an excavated ulcer; and Sigmund[3] virtually adopts the same view, which is not unlikely to be confirmed by farther observation.

But are these points of difference sufficient to induce us to make a distinction between syphilis derived from a primary and that from a secondary symptom, and to deny that the first effect of the virus

[1] Histoire Naturelle de la Syphilis.
[2] Du Chancre, etc., p. 66.
[3] See Medical Times and Gazette for Aug. 3, 1861, p. 121.

is in both a chancre? I think not. The main features of the initial lesions in the two cases are the same. I believe that our ideas of the objective symptoms of a chancre have been by far too limited, and that it is unreasonable to expect invariable uniformity in its aspect. The ulcerated and indurated papule, attended by engorgement of the neighboring ganglia, which appears after inoculating the secretion of a general manifestation of syphilis, cannot be ranked among secondary symptoms from which it is separated by a period of incubation; it is evident that it can only be called primary, and I believe, with Langlebert, Rollet (whose line of argument has for the most part been followed in the present section), and Fournier, that it is fully entitled to the name of chancre. Ricord has as yet failed to express himself upon this subject, but the opinion of his pupil, M. Fournier, who is associated with him in the publication of his *Leçons sur le Chancre*, may be taken as an indication that he regards this new doctrine with favor, even if he does not yield it his full sanction.

[While this work is passing through the press, I have been informed of an apparent case—the first on record, so far as I am aware—of the transmission of syphilis in the tertiary stage.

The unfortunate victim is an eminent surgeon of Ohio, who operated upon a case of syphilitic necrosis of the skull in a patient who had had no secondary symptoms for several years. An abrasion upon the finger of the surgeon became inoculated, and a chancre and general symptoms followed in the usual order. Full details of the circumstances furnished me by the surgeon himself, leave little doubt on my mind that this was an instance of the inoculation of the blood in the tertiary stage of syphilis. The case will probably be reported in full elsewhere.]

CHAPTER V.

PROGNOSIS OF SYPHILIS.

THE opinion very generally prevails, that syphilis is a disease which, if left to itself, will always go on from bad to worse, attack in its progress the deeper and more important organs, and probably terminate in death. The correctness of this opinion, at least so far as concerns its invariability, may well be called in question, since syphilitic patients are rarely, if ever, allowed to go without treatment, and consequently little opportunity is afforded for observing the natural progress of the disease; and we cannot logically infer, because certain cases, in spite of remedies, pursue a disastrous course, that the same would have been true of others, which have terminated favorably, if the treatment had been less thorough, or had been altogether omitted. It would be more reasonable, though less flattering to ourselves, to conclude that as art has been comparatively impotent in the former, it can claim for itself but a portion of the credit in the latter.

I have had no unusual facilities for observing the natural course of syphilis, but several circumstances have led me to believe that, in many instances, under favorable circumstances, this disease tends to self-limitation. I have been struck with the fact that some patients, who either through neglect or ignorance fail to pursue any continued course of treatment, still live in comparative comfort, and, after several attacks of general symptoms, extended through a number of years, are finally free from farther annoyance; the disease probably remaining dormant in the system, but ceasing to betray itself by any external manifestation. I have seen, as probably nearly every surgeon has who has had much to do with venereal, patients now perfectly well, but bearing evident marks of former syphilis, and who are yet totally ignorant that they ever had the disease, and who certainly have never been treated for it. Two cases out of a number that might be related, will suffice to illustrate this point.

A young man, aged 21, was recently brought to my office in consultation for morbid sensibility of the retina. On examining his

eyes, I find posterior synechia, indicating an attack of iritis at some previous time. After considerable trouble in unravelling his case, I ascertain the following facts: At the age of 16 he contracted an ulcer upon the penis from impure intercourse; three months after he had sore throat, scabs in the hair, alopecia, and an eruption upon the skin; six months after he had an inflamed eye, attended with considerable intolerance of light, and pain. He was at the time young and ignorant of any such disease as syphilis; was told by his attending physician that he had caught cold in his eye, and had never suspected the nature of his complaint. The well-informed physician who brings him to my office, tells me that he has been under his observation for the last two years, and has never presented the slightest symptom of syphilis, and the most careful examination fails to discover any activity of the poison at the present time.

Again, a young lady, aged 18, accompanied by her mother, came to my office to be treated for interstitial keratitis. Believing, as I do, in the general truth of Dr. Hutchinson's views as to the specific character of this affection, I at once examined the teeth and found that conformation of the central upper incisors which is so characteristic of congenital syphilis. After closely questioning the mother, there could be no doubt that she, shortly after her marriage, was infected with syphilis by her husband, but she had never had the slightest suspicion of it nor had she ever been subjected to specific treatment, although she is now in the enjoyment of perfect health.

Again, evidence of a tendency to self-limitation is found in many cases in which treatment is faithfully pursued, and in which the disease, under the best management on the part of the surgeon, and the utmost obedience of orders by the patient, repeatedly recurs for a time, and yet ultimately disappears, without our being able to attribute this happy termination to the accumulated effect or prolonged use of remedies, which have failed to afford permanent relief in the earlier attacks. I have so often found this to be the case, that I do not hesitate to assure patients when discouraged by the reappearance of symptoms which they supposed were cured, that the tendency to return will probably cease after a time, and leave them in the enjoyment of a fair state of health; although never, after treatment however prolonged, do I promise certain immunity for the future. I can recall to mind quite a number of patients whom I treated for syphilis eight or ten years ago, and whose disease repeatedly returned, and was apparently uncontrollable by medicine for a period of from one to three years, but who have since been exempt from farther trouble, and some of whom have

married, and become the fathers of healthy children; and I cannot honestly ascribe their present immunity wholly to the remedies employed, but in a great measure to the fact that the activity of the disease has been exhausted.[1]

This belief in a tendency to self-limination—or, as it may be called, *spontaneous quiescence*—of syphilis, derived from my own experience, coincides very nearly with that of Diday, which has but recently fallen under my notice. This surgeon's mode of practice has afforded him a most excellent opportunity for deciding this point, since, in the great majority of syphilitic cases, he withholds all treatment, unless compelled to its resort by the urgency of the symptoms. As the results of his experience since adopting this course, Diday remarks, in the first place, that he has been struck with the regular evolution and succession of syphilitic phenomena, and afterwards goes on to say that, in most cases, the disease never passes beyond the secondary stage; that, after several successive attacks—as, for instance, of mucous patches, exanthematous or papular eruptions, etc.—the symptoms diminish in intensity; the virus appears to be eliminated by the natural powers of the system; the tendency to fresh manifestations disappears, and a permanent and spontaneous cure is obtained. In a few persons, on the contrary, he has found the disease become more serious and more deeply rooted by time; hence, he admits two classes of cases, in one of which syphilis naturally decreases, and in the other increases in intensity; in the former, he resorts to hygienic measures alone; in the latter, he employs specifics, but not to the neglect of hygiene.[2]

Since the issue of the first edition of this work, Diday has published the results of his experience in detail, and the importance of the subject demands a few moments' consideration.

Out of forty-three cases, treated by the non-mercurial plan, in twenty-six the general symptoms never assumed a serious character and consisted merely of syphilitic fever, acne capitis, roseola, and mucous patches. These lesions reappeared on several occasions but always with decreasing severity; the disease never passed into the tertiary stage; and finally the general health was completely re-established. In eighteen of these cases, sufficient time has elapsed to render the permanence of the cure all but certain; thus, the period

[1] "That all the constitutional forms of syphilitic affections, if left to the unaided powers of nature, have a constant tendency to wear themselves out, I am fully convinced." EGAN, *Syphilitic Diseases*, p. 245.)

[2] Nouvelles Doctrines sur la Syphilis, p. 302 et seq.

between the last syphilitic manifestation and the date when the patients were last seen in perfect health has been in—

3	cases	. .	3½ years.
3	"	. .	4 "
4	"	. .	4½ "
3	"	. .	5 "
1	"	. .	5½ "
1	"	. .	6 "
1	"	. .	8 "
1	"	. .	9 "
1	"	. .	16 "

On the other hand, in seventeen of the forty-three cases treated without mercury, the symptoms assumed a more serious aspect, threatening impairment of various organs and permanent injury to the constitution; some of them passed into the tertiary stage; and although it is possible that in more or less of them a spontaneous cure might have taken place, yet the safety of the patients seemed to demand the administration of mercury, which was accordingly given. The following table exhibits the difference in these two classes of cases in respect to the number of the successive appearances or outbreaks of general symptoms:—

NUMBER OF OUTBREAKS.	IN THE MILD SERIES.	IN THE SEVERE SERIES.
1 . .	3 cases.	
2 . .	14 " . .	3 cases.
3 . .	8 " . .	4 "
4 . .	1 " . .	3 "
5 or 6		7 "

Besides being more numerous, the outbreaks of general manifestations, as a general rule, occurred at shorter intervals in the severe than in the mild class of cases.

According to Diday, the following are the most valuable indications to show that an attack of syphilis in a given case will be mild: a long incubation and a superficial character of the initial lesion, or chancre; simple roseola without papules as the first manifestation upon the skin; a gradual diminution in the size of the engorged ganglia; infrequent outbreaks of general manifestations, separated by comparatively long intervals, and decreasing in severity.

On the other hand, a severe attack is indicated—by a short incubation and deep ulceration of the primary lesion; by the eruption

upon the scalp assuming a decidedly pustular character; by ulceration of mucous patches in positions where, in mild cases, they are almost always superficial, as upon the sides of the tongue, on the scrotum, margin of the anus, or vulva; a papular, vesicular, pustular, or squamous eruption as the first syphilide; persistency, or, having once subsided, tardy reappearance of the glandular engorgement; frequency and increasing severity of the successive outbreaks of general manifestations.

The severity of the attack does not appear to be in direct ratio with that of the syphilitic fever which commonly precedes or accompanies the earliest outbreak of general symptoms, the fever frequently being most severe in those cases which prove the mildest; nor, so far as we know, can any indication be drawn from the length of the period of incubation of general manifestations. According to Diday, hereditary origin has an aggravating influence upon syphilis, both in the infant and in any person to whom the latter may communicate it; on the contrary, syphilis contracted from a secondary lesion (of acquired, not hereditary syphilis), is commonly of a mild type.[1] The above indications, however, should be received with much caution, as they are founded upon a small number of statistics, and require farther investigation. In my own experience, they have repeatedly been falsified, although I am not prepared to deny their value in general.

Diday's experience, impartially considered, appears to me to demonstrate the truth of the following propositions:—

1. In a certain number of cases, probably the majority, syphilitic manifestations, even in the absence of specific treatment, will in time disappear spontaneously without assuming a serious character or producing permanent impairment of the constitution.

2. In other cases, probably the minority, nature, unaided by art, is inadequate to effect a cure, and the interests of patients require a resort to mercury in addition to attention to hygiene.

Neither of these conclusions is less important than the other. The admission of both of them will probably satisfy the extremists of neither school, mercurialists or non-mercurialists, but is, I believe, the "happy mean" which approaches nearest the truth.

The power of nature in the cure of syphilis should never be lost sight of in the treatment of this disease. Experience has long since shown that specific remedies, in order to be of any avail, must not be pushed to the detriment of the general health or be administered

[1] Diday. Histoire Naturelle de la Syphilis.

at all when the system is greatly depressed, otherwise the disease will acquire a firmer hold, and the patient's condition be rendered worse instead of better; yet in spite of this lesson, in undertaking the treatment of a case, the surgeon finds it a difficult matter to refrain from administering mercurials, provided he believes that these alone are capable of eradicating the disease; but if convinced that nature is not altogether powerless to eliminate the virus, he can wait patiently until the general health has been improved, satisfied that any delay which will give the vital powers a better chance to act, will not be time wasted. Again, who has not been disappointed and chagrined at the return of syphilitic symptoms after the most thorough course of treatment? But may it not be that nature is still carrying on the work of cure, which will be brought to a happy conclusion at a time which art can no more hasten than it can arrest the progress of an eruption of variola or scarlatina? In short, we cannot admit, especially with the evidence existing to the contrary, that the vital powers afford a certain amount of protection against all other known diseases, but are impotent against the ravages of syphilis; and a proper appreciation of these views will not render the surgeon inactive, but will, by holding out a better hope of success, induce increased efforts.

CHAPTER VI.

TREATMENT OF SYPHILIS.

In the previous chapter I have endeavored to show that the prognosis of syphilis in the majority of cases is favorable; and that even without treatment, the disease will very frequently terminate spontaneously and leave no permanent injury to the general health or impairment of any organ. I have not intended, however, to advocate abandoning syphilis to itself; far from it; but merely to demonstrate what the powers of nature are in the elimination of the poison from the system.

To cure "quickly, safely, and pleasantly," I need not say, should be the aim of our art. Even if it could be proved that all cases of syphilis were susceptible of a spontaneous cure (a conclusion which we have seen to be controverted by Diday's experiments as it is by the general testimony of the profession), it would not follow that each of the three desiderata above mentioned could be attained equally well as by the use of remedies. There are other considerations than the possibility of eventual recovery, and ones that affect even more intimately the interests of society and the individual. Is a man or woman with syphilitic lesions, a husband or wife, or, at all events, one who is necessarily brought in more or less intimate contact with daily associates, to be allowed to remain even for a limited time a focus of contagion, if it be in our power to prevent it? Is there any one so dead to shame as to be willing voluntarily to bear upon the person the evidences of immorality? Admitting that nature can sometimes cure the disease, and knowing that sometimes it cannot, can we tell just how long it is safe to procrastinate, and exactly when treatment must come in, or important organs or functions will be compromised? While, therefore, I believe that Diday, in abandoning a series of syphilitic cases chiefly to the unaided powers of nature, and thus confirming beyond dispute the fact already suspected by others that the disease is susceptible of a spontaneous cure, has made a most important contribution to science, I cannot subscribe to his objections against the use of mercury when

judiciously administered, nor uphold his practice as worthy of imitation. At the same time I am free to confess that additional experience has led me to modify in a measure my former views as to the *curative* power of mercury (in contradistinction to its power of repressing syphilitic manifestations), and to believe that ultimate restoration to health is due in many cases more to the self-limitation of the disease than to the remedies employed; and this modification has naturally been followed by a corresponding change in practice, chiefly in respect to the length of time mercurials should be continued after the disappearance of all syphilitic symptoms.

In the treatment of syphilis it is the duty of the surgeon to regulate the hygiene of his patient, and, as occasion may require, to administer tonics, mercurials or the iodides.

HYGIENE AND TONICS.—The successful management of any case of syphilis undoubtedly depends in a great measure upon attention to hygiene. The most careful administration of specific remedies will be of little avail, unless the patient be willing to submit to the necessary restrictions with regard to diet, exercise, exposure, etc. Many syphilitic patients who enter our hospitals begin to improve at once, simply from the fact that they are brought under better hygienic influences, and are obliged to lead a regular course of life and abstain from excesses which have hitherto depressed the vital powers and thwarted all attempts of nature or of art to eliminate the virus from the system.

The essential features of the hygienic plan which is adapted with slight variation to nearly every case of syphilis, are general regularity of life, simple but nourishing diet, abstinence from the free use of stimulants and tobacco, attention to the functions of the skin and bowels, and, last but not least, a cheerful disposition. The habits of the patient should be systematic and regular, especially as regards his hours of eating, his sleep and exercise. Irregularity in these respects exercises a drain upon the vital powers, the whole force of which is requisite to eliminate the poison from the system. The diet should be plain but nourishing; *plain*, in order that digestion may not be too much taxed; sufficiently *nourishing*, that nature may be sustained in the work it has to accomplish, and that the depressing influence of the virus may be counteracted. It is impossible, however, to give minute directions which will be applicable to all cases, when the condition of different persons is so various, and when so much must necessarily be left to the judgment of the surgeon. The abstemiousness recommended in certain

methodical modes of treatment, as in that by Zittmann's decoction and the dry treatment of the Arabians,[1] is adapted for patients who devote their whole time to treatment and who lead an inactive life confined for the most part to the house, but will not answer for those who are engaged in labor or the active calls of business. Abundant testimony proves that any dietetic course which weakens the system affords to syphilis a stronger hold upon the constitution. When a patient, the victim of dissipation, has for a long series of years been accustomed to artificial stimulus until it has become a second nature to him, it may not be best to cut him off entirely from his daily potations, but they should be given methodically under the special supervision of the surgeon, and at meal times rather than on an empty stomach. In such cases, it is often safer to administer stimulants in the form of medicine, as the compound tincture of gentian; since in this way the necessary moderation can best be secured. On the other hand, habitual high-livers require to be restricted in the quantity and quality of their food and drink; and between these two extremes every shade of variation may be met with.

The secretions should also receive attention. That of the skin should be promoted by regular exercise not carried to fatigue, bathing and friction. The season of the year, and the habits and condition of the patient will determine whether a cold bath every morning, or a hot bath two or three times a week, should be preferred. Flannel or merino underclothes should be worn and changed frequently; and the bowels should be opened at least once a day. Absolute continence in men accustomed to frequent sexual indulgence may induce nocturnal pollutions and consequently be objectionable, but coitus should be practised only as a relief to the system and never be carried to excess.

Tobacco exercises a depressing influence upon the vital powers, and is moreover objectionable in consequence of its irritant effect upon the mucous membrane of the mouth and fauces. Mucous patches of this region in smokers and chewers are especially obstinate, and will often persist in spite of remedies, unless the exciting

[1] The dry treatment of the Arabians, as communicated by an Arab physician who visited Marseilles, is described by M. Benoit, who has tried it with very satisfactory results, as have also Lallemand, Broussonnet, L. Boyer, Tribes, Jaumes, and Malinowski. The patient is directed to abstain from his usual articles of food: lives on biscuit, dried almonds, figs, and raisins; takes for his only drink in the twenty-four hours a glass or two of a decoction of sarsaparilla; and a mercurial pill morning and evening. Gaz. Hebdomadaire, May 4, 1860, from the Montpellier Médical, 1860, Nos. 1 and 2.

cause be removed. Total abstinence from the weed should peremptorily be insisted upon with all syphilitic patients.

The influence of the mind upon the body is rarely exhibited in a more striking manner than in syphilitic subjects; those cases commonly proving most intractable, in which patients are anxious and despondent, and constantly watching and examining themselves to discover some new symptom. The surgeon is not always blameless in this matter, for promises of a cure within a fixed time or after a certain course of treatment are almost sure to be falsified, and to be followed by disappointment and depression of spirits. It is therefore desirable to be frank at the outset, and to tell patients that no treatment, however thorough or prolonged, will afford certain immunity for the future; that it is the nature of syphilis to manifest itself by repeated outbreaks; that consequently the reappearance of symptoms is not necessarily to be regarded as a relapse; that the work of cure may still be going on; and that with proper care the chances are strongly in favor of ultimate recovery and complete restoration to health. There is a disease worse than syphilis, viz., *syphilophobia*, which has no tendency to self-limitation, over which remedies have no control, and which can only be cured by the exercise of a strong and manly will.[1] The syphilitic subject who would avoid this greater evil and place himself in the most favorable condition for recovery from his actual disease, must shun gloomy thoughts, give his mind and body healthy occupation, and cultivate a cheerful disposition.

Examination of the blood of persons in the early stage of syphilis shows a diminution of blood-corpuscles and an increase in the proportion of serum — a statement which will be farther developed in the next chapter. This "chloro-anæmia," as it is very properly called, is chiefly confined to the primary and early stage of secondary symptoms — hence the special value of tonics at this period of syphilis; but they are hardly less desirable in the later stages to counteract the depressing influence of the disease and to assist the action of specific remedies. Unless decidedly contraindicated by a plethoric condition of the patient, they should be included in the therapeutic means employed in all stages of syphilis, and they may commonly be administered with advantage for several months after specific remedies have been suspended. Nearly all of the mineral and vegetable tonics may in turn prove serviceable. The most use-

[1] I have recently met with a sad case in which syphilomania led a patient under my charge to commit suicide several months after all syphilitic manifestations had disappeared.

ful are quinine, the preparations of iron, and gentian. To these should be added iodide of potassium, which, as shown by Ricord's experiments, has a decided effect in restoring the blood to its normal condition in the chloro-anæmia of early secondary syphilis.

The chief remedies which are supposed to act directly in the cure of syphilis, are mercurials, and iodine and its compounds. The former exert their therapeutic action mainly upon secondary and the latter upon tertiary symptoms, so that the susceptibility of a given lesion to one or the other will indicate to which stage of syphilis it belongs. This rule, however, is not so invariable as the above statement would make it appear, and requires explanation.

There is no distinct line of demarcation in respect to treatment between secondary and tertiary lesions, but a gradual transition from one to the other. By far the most powerful agent in the treatment of the chancre and the earlier general symptoms is mercury; as the disease progresses, iodine gradually begins to exercise a therapeutic influence; those symptoms which border upon the boundary line between secondary and tertiary manifestations, and which constitute the stage of transition—so-called by Ricord—require a combination of mercury and iodine; finally tertiary symptoms yield with great facility to iodine and with difficulty to mercury, though it is very doubtful whether the former agent without the assistance of the latter, can effect their permanent removal.

MERCURIALS.—Mercury came into general use in the treatment of syphilis within fifty years after the appearance of the Italian epidemic,[1] and, in spite of the many attempts which have been made to supplant it by other remedies, still holds its ground as the only reliable agent for combating secondary lesions. At the present day its efficacy is admitted both by regular and irregular practitioners, though the latter generally administer it furtively and under the guise of some other name. It is the active ingredient of most of the "life-balsams" and "essences of sarsaparilla," the marvellous virtues of which for the cure of "private diseases" are proclaimed in our daily and weekly journals (religious as well as secular). The elastic principle of "similia similibus" is also made to cover it; the more conservative Homœopaths giving it (generally in the form of the protiodide) in the doses prescribed by the U. S. Pharmacopœia.[2]

[1] HÆSER (Historisch-Pathologische Untersuchungen, vol. i. p. 230), according to VIRCHOW, quotes a satirical poem composed by Georgius Summaripa, of Verona, in 1496, in which the use of mercury in syphilis is mentioned.

[2] I was recently treating a case of syphilitic iritis with half a grain of the protiodide three times a day, when a friend of the patient, a distinguished homœopath of this city, advised him to take the same quantity four times a day.

and even the extremists not trusting to the "dynamic action" of high potencies, but employing the first trituration (one part to ninety-nine of sugar of milk), put up in bottles carefully coated with black paper to protect it from the action of light.

No one form of mercury can be used exclusively in all cases and in all stages of the disease. A preparation which agrees with one person will not unfrequently disagree with another, and it is sometimes necessary to make a trial of several before the one best adapted to the case can be selected. Again, after employing one form for a time, when the system has become accustomed to it, it is often desirable to change to another; in this manner the therapeutic action may be increased without resorting to large doses, which are liable to disarrange the bowels.

When administering mercurials for a chancre, which it is desirable to heal as soon as possible either to avoid communicating it to others, or to remove the inconvenience of the local sore, or when commencing the treatment of general symptoms which are of such a character as to confine the patient to the house, or which are liable to expose him to his associates, some preparation should be selected, as the blue mass, calomel, or gray powder, which will most speedily affect the system. At first, however, mercury should be given very cautiously, and in small and infrequent doses, since the patient's susceptibility is generally not known before trial, and salivation should be carefully avoided. Contrary to a very general but mistaken idea, at least as applied to the treatment of syphilis, the mouth is much more readily affected by the first mercurial course than ever afterwards; hence particular caution should be exercised at this time. The condition of the blood in early secondary syphilis, already referred to, renders it desirable to associate a tonic with the mercurial, as in the following formulæ:—

℞. Pilulæ hydrargyri ℈ij.
Ferri sulphatis exsiccati ℈j.
Extracti opii gr. v.
Mix and divide into twenty pills.

℞. Hydrargyri cum cretâ ℈ij.
Quiniæ sulphatis ℈j.
Mix and divide into twenty pills.

I have been led by observation to believe that the addition of quinine renders mercury less liable to salivate, and thus serves a double purpose.

When there is special reason for desiring speedy mercurial action,

a combination of several preparations may effect the purpose sooner than one alone.

℞. Pilulæ hydrargyri ℈j.
Hydrargyri chloridi mitis gr. x.
Hydrargyri cum cretâ ℈j.
Ext. opii gr. v.
M. In twenty pills.

It is best to commence with one of the above pills morning and night, and, if no effect be perceptible by the fourth or fifth day, to increase to three a day. So soon as the chancre begins to assume a more healthy aspect, or the secondary symptoms to subside, no farther change in the treatment is required, unless, on the one hand, the mouth become tender, or, on the other, the symptoms cease to improve; in the former case the remedy must be suspended, and in the latter increased.

The dose of the protiodide is half a grain, which is to be given in a pilular form two or three times a day. I have sometimes increased the dose to two grains in the twenty-four hours, but have never derived any benefit from exceeding this quantity, which alone is apt to produce diarrhœa. Indeed, the chief objection to this preparation is the abdominal pain and intestinal irritation which it often occasions; but these may in most cases be avoided by directing the patient to take his pill about an hour after meals, when the stomach is not entirely empty, or, if necessary, by the addition of opium; if these measures fail, some other form of the mineral must be employed. The sugar-coated granules of the protiodide, prepared by Garnier, Lamoureux, and Co., each of which contains one-fifth of a grain, afford a very convenient and elegant mode of administration, and, by their minute division, enable the surgeon to graduate the dose from day to day according to the exigencies of the case.

The protiodide is Ricord's favorite form of mercury, and has acquired a wide-spread and well-deserved reputation. Sigmund,[1] however, whose extensive experience entitles his opinion to consideration, speaks disparagingly of it on account of its tendency to produce diarrhœa, and thinks it of little value except in papular and pustular syphilitic eruptions, and even then inferior to some other forms of mercury.

A convenient mode of exhibiting the biniodide of mercury is by decomposing the bichloride by means of the iodide of potassium, and

[1] Wien Wochenschrift, 1859, No. 39.

dissolving the precipitated biniodide with an excess of the iodide of potassium, as in the following formula.

℞. Hydrargyri bichloridi gr. ij.
Potassii iodidi ʒss.
Aquæ ℥viij.
M.

Dose.—A dessertspoonful an hour after eating, two or three times a day.

Gibert's favorite formula, which is much employed at the Saint Louis and other hospitals of Paris, where it is known as the "syrup of the ioduretted biniodide of mercury," is as follows:—

℞. Hydrargyri biniodidi gr. j.
Potassii iodidi ℈ijss.
Aquæ ʒj.
Filter through paper and add—
Syrupi ℥v.
M.

Dose.—A tablespoonful.

Mr. Langston Parker recommends the following:—

℞. Hydrargyri biniodidi gr. iij.
Potassii iodidi ʒj–iij.
Spiriti vini ʒj.
Syrupi zingiberis ʒiij.
Aquæ ℥iss.
M.

Dose.—Twenty to thirty drops three times a day in half a tumblerful of some decoction of the woods.

Such combinations of mercury and iodide of potassium are the more valuable, the longer the time which has elapsed since contagion. In late secondary lesions, I often administer a grain of the protiodide of mercury at noon and the iodide of potassium morning and night.

The bichloride commends itself from its slight tendency to produce salivation, the tolerance with which it is borne by the system, and the safety with which it may be continued for a long period; it is, therefore, especially worthy of employment in patients living at a distance from their surgical attendant; in those who are peculiarly susceptible to the morbid action of mercury, and in persons of a broken-down constitution. The disadvantage of the bichloride is, that the very impunity with which it may be used renders it less active in subduing the symptoms in obstinate cases, and I am now in the habit of employing it less than formerly. It is to be recommended, however, under the circumstances above mentioned, and also, in some cases, in minute doses as an adjunct to the external use of mercury, either by inunction or fumigation.

The bichloride of mercury may be administered in solution or in a pill. It is very liable to undergo decomposition, and, with the intention of preventing this, is usually associated with muriate of ammonia. The average dose for an adult is one-sixteenth of a grain. but is sometimes raised to a fourth or even half a grain; in the treatment of syphilis, however, I have rarely found it beneficial to exceed one-eighth or one-sixth of a grain, given three times a day upon a stomach not entirely empty; even in this quantity it is difficult to prevent intestinal pain and irritation.

This preparation of mercury was extensively used by Van Swieten,[1] and is the active ingredient of the "liquid" known by his name, the formula for which is as follows:—

℞. Hydrargyri bichloridi 1 pt.
Aquæ 900 pts.
Spiriti rect. 100 pts.

The average dose of Van Swieten's liquid is a tablespoonful, which is given in a glass of sweetened water.

The solubility of the bichloride of mercury in alcohol and water facilitates its administration in any of the vegetable tinctures and infusions which are often required in anæmic subjects. When given in this form, it doubtless undergoes partial decomposition, but does not appear to lose its therapeutic effect. I frequently employ as a menstruum the tincture of the chloride of iron.

℞. Hydrargyri bichloridi,
Ammoniæ muriatis, āā gr. iij.
Tinct. cinchonæ comp. ℥iij.
Aquæ ℥iij.
M.

From a teaspoonful to a tablespoonful two or three times a day.

℞. Hydrargyri bichloridi gr iv.
Tinct ferri chloridi ʒiv.
M.

Eight drops contain very nearly one-sixteenth of a grain of the bichloride.

The pilular form is more convenient for many persons. Equal parts of the bichloride of mercury and the muriate of ammonia may be dissolved in a very small amount of pure water, with which finely-powdered cracker is to be mixed in sufficient quantity to absorb it; syrup of gum acacia is added to give it consistency, and the mass rolled into pills containing the desired quantity of the bichloride. Extract of dandelion is also a convenient vehicle, but is more liable to decompose the mercurial.

[1] Commentaries, xvii. 292.

It is a fact but little known that the bichloride may be administered in cod-liver oil by first dissolving it in a few drops of sulphuric ether. If the bottle be kept tightly corked it may be retained in solution for an indefinite time; but if the ether be allowed to evaporate by exposure to the air, the bichloride will be precipitated and cannot be redissolved by the addition of more ether.

℞. Hydrargyri bichloridi gr. ij.
Etheris sulphurici ʒj.
Dissolve and add—
Olei morrhuæ ℥vj.
M.

A dessertspoonful contains one-twelfth of a grain of the bichloride.

The preparations of mercury above mentioned are those which are found to be the most serviceable in the treatment of syphilis, though others, as, for instance, Plummer's pill, may sometimes be employed to advantage. Montanier states that the acetate of mercury has sometimes proved successful when other preparations have failed.[1]

Increased experience in the treatment of syphilis, however, has led me to give a decided preference to the external over the internal use of mercury, in any outbreak of general symptoms subsequent to the first. In the earliest attack of general manifestations, small doses of the blue mass or mercury with chalk are commonly sufficient to subdue the symptoms without unpleasant action upon the gums or bowels; but at a subsequent period tolerance of the remedy has often been acquired and the administration of sufficient doses to accomplish the desired end will very frequently induce diarrhœa, salivation or general cachexia; while the use of mercury by fumigation or inunction rarely salivates or causes diarrhœa, does not disarrange the stomach, and, it has appeared to me, has a much more decided effect upon the disease than mercury by the mouth. I frequently see symptoms which have persisted for many months under the internal use of mercury, rapidly subside and disappear as the effect of its external application. The choice between fumigation and inunction, in most cases in private practice, must be determined in a measure by the convenience of the patient; but I prefer the former, when circumstances will permit.

Fumigation.—Mercurial fumigation was employed at a very early period in the treatment of syphilis, but fell into almost complete disuse until revived by Mr. Langston Parker, of Birmingham, Eng.

[1] Gaz. des Hôpitaux, No. 19, 1856.

In Mr. Parker's method, the vapor of water is combined with that of mercury, constituting a "moist mercurial vapor bath," which is regarded by its author as a means of treating syphilis "safer, quicker, more certain, less frequently followed by relapses, and more efficient in obstinate cases than any other," and from my own experience I can testify to its very great value.

The mercurial vapor may be generated from metallic mercury, calomel, mercury with chalk, the bisulphuret, the gray oxide or the binoxide, from a scruple to three drachms of which are required for each bath, the quantity being proportioned to the effect desired. Mr. Parker states that in skin diseases, the bisulphuret is to be preferred; in diseases of the throat and nose, the gray oxide, binoxide, or calomel is better, because the patient can bear the head immersed without sneezing or coughing, which he cannot do when the bisulphuret is used.

I commonly employ calomel, as recommended by Mr. Henry Lee, or the black oxide of mercury, and also the lamp introduced by the same surgeon, which is a great improvement over the more elaborate and costly apparatus formerly in use.[1]

Fig. 40.

The best time for taking the bath is just before going to bed. The circular groove, B, is to be filled one-third full of boiling water, the alcohol lamp beneath lighted, and, at the last moment, about a scruple of calomel to be deposited upon the plate, A. The

[1] Mr. Lee's lamp, slightly modified and, I think, improved, after my suggestions, is manufactured by Messrs. G. Tiemann and Co., Chatham St., N. Y.

patient, stripped of his clothing and enveloped in one or more blankets drawn closely round the neck, sits upon a cane-bottomed chair with the lamp between his legs. In the course of five to ten minutes, profuse perspiration is induced; the calomel is wholly evaporated within fifteen to twenty minutes, when the lamp may be blown out, and the patient, after waiting five or ten minutes longer exposed to the moist vapor, may retire to bed. I commonly advise, as recommended by Mr. Lee, that the use of a towel after the bath should be avoided, so that the thin layer of mercury deposited upon the surface of the body may remain and be farther absorbed. In order to prevent too sudden a change of temperature it is well for the patient to remain enveloped in the blanket on going to bed, or, before immersion, he may put on a long flannel night-gown which can be drawn up around the neck until he is ready to retire. I have never, however, seen any ill effects from "taking cold," nor found it necessary to restrict patients with regard to exposure to the weather any more than when giving mercury by the mouth.

In the absence of Mr. Lee's lamp, a simple apparatus may be extemporized by heating a brick to redness and placing it in a shallow vessel partly filled with boiling water. A scruple of calomel is to be sprinkled upon the brick, and the bath otherwise conducted as above described.

The frequency of the baths should be determined by the strength of the patient and the degree of mercurial action desired. In cases of secondary syphilis, when the strength of the patient is fair, every night is not too frequent; in debilitated subjects and in cases of tertiary syphilis when only a slight effect from mercury is desired, from one to three times a week is sufficient. During the period of their administration, the patient should wear flannel next the skin and observe the hygienic rules, heretofore laid down; and mercury in minute doses, iodide of potassium, or tonics may be given internally. The syphilitic symptoms often exhibit an improvement after the first or second bath and generally disappear in the course of from one to three weeks, but the treatment should be continued for two or three weeks longer.

The most frequent complaint made by patients against this mode of treatment is a feeling of debility, and sometimes headache; effects which I believe to be due to too great an amount of steam. The difficulty may be obviated by diminishing the amount of water, and shortening the duration of the bath. If necessary, so little water may be used that the whole of it will be evaporated in the course of ten minutes, after which the force of the flame is expended

upon the mercury. The gums frequently become tender, but decided salivation is very rare. In some instances, the physiological effect of the mercury is manifested by a slight diarrhœa, such as often takes place in a greater degree after the prolonged internal use of the mineral. Is this effect due to the irritant action upon the mucous membrane of the bowels produced by mercury that has found its way into the intestine?

Inunction.—Inunction is a less cleanly and therefore more disagreeable external mode of using mercury than fumigation; but it is more convenient for many patients, and its effect is hardly less satisfactory. Sigmund, who used mercurial inunctions in 9,379 cases, occurring at the Vienna Hospital between the years 1842 and 1855, regards this as the simplest and most efficacious mode of treating the various forms of syphilis.[1] The manner of employing mercurial inunction is as follows.

The patient should be prepared by taking one or more hot baths, so as to render the skin clean and soft. The evening, before retiring, is the most favorable time for the application, when about a drachm of the strong mercurial ointment is to be rubbed into some portion of the surface, exposed, if possible, to the heat of a fire, until most of it has been absorbed, which usually requires about fifteen minutes. At the first application, the axillæ and inner sides of the arms may be selected for the inunction; at the second, the outer sides of the arms; at the third, the outer sides of the thighs; at the fourth, the hams and legs; at the fifth, the surface of the chest; and at the sixth, that of the abdomen; when the above order may be repeated. In this way, excoriation and irritation of the skin from excessive friction of any one portion, may be avoided; and, for the same reason, it is better not to apply the ointment in the neighborhood of the sensitive skin of the scrotum. Any portion of the ointment which has not disappeared during the friction should be allowed to remain and not be washed off; and the patient should sleep in the same flannel under-clothes that are worn during the day. The great safeguard against salivation is freedom of the bowels, and the use of an astringent gargle, as a solution of borax or alum. If this, or any other bad effect of mercury ensues, the surface of the body should at once be cleansed by means of soap and hot water.

BAD EFFECTS OF MERCURY.—Before commencing treatment for

[1] Medical Times and Gazette, May 5, 1857; from the Wien Wochenschrift, 1856 No. 36.

general syphilis, a patient is often weighed down with languor and general malaise, which are the effect of his disease; under the use of mercury, his strength and spirits improve, and he becomes light, active, and buoyant; mercury thus far has indirectly acted as a tonic; after continuing treatment for some time, however, it is frequently the case, that although his symptoms have constantly improved, he is again subject to depression, but if questioned as to the cause or nature of his feelings, can give no satisfactory reply; his low spirits and uncomfortable sensations cannot be defined or explained, but are none the less real. This condition is unquestionably due to the prolonged influence of mercury, since I have always found it yield to a suspension of specific remedies, whether aided or not by a cathartic, and a change of air and scene for a few days, when this is practicable. Bearing in mind this effect of mercury, I believe that the combination of opium with the mercurial, which is commonly adopted, is not only serviceable in restraining action upon the bowels, but also in diminishing the sensibility of the nervous system, and enabling it better to support the continued use of specific remedies.

Salivation.—The most frequent unpleasant effect of the administration of mercurials, and the one which it is especially necessary to guard against, is salivation, though this formerly was thought to be a desirable result of treatment, and to favor the cure of syphilis. The therapeutic effect of mercury undoubtedly precedes its morbid action, although the two are often separated by a short interval only, and sometimes appear to be synchronous. If we carefully observe the phenomena which ensue after commencing a mercurial course, selecting by preference a case which has as yet received no treatment, and in which the effects of mercury are generally most clearly marked, they are usually found to be as follows: for the first few days, no improvement is perceptible in the symptoms, which may even become aggravated; the chancre may spread over a larger extent of surface, or new secondary lesions may appear; suddenly, however, the primary sore begins to assume a more healthy aspect, and the process of cicatrization to advance from its circumference towards the centre; the indurated base and neighboring lymphatic ganglia lose somewhat of their hard and cartilaginous feel; or the syphilitic eruption commences to fade away. If now the mercurial be continued, even though the quantity administered be not increased, tenderness of the mouth rarely fails to appear in the course of a very few days, and frequently as soon as the second or third day after the first improvement was noticed in the symptoms. In a few instances

only does an amelioration in the symptoms appear to coincide with decided salivation, and in such cases the action of the mercurial has generally been so rapid, that an interval between the two may readily have been overlooked. Again, if mercury be continued after salivation has taken place, its therapeutic action is not increased, but, in most cases, on the contrary, the symptoms are aggravated. The practical inference from the above remarks is, that the specific treatment of syphilis may be carried to tenderness of the gums, in order to afford assurance that its full therapeutic effect has been obtained, but that it should not intentionally be pushed to complete salivation, and never in any case be continued beyond this point.

I have already called attention to the fact that a patient is much more liable to be salivated by the first than by any subsequent course of mercury; the system becoming tolerant of its presence by repeated use. This fact has been so evident in my own practice, that I am surprised that it has not attracted more attention, although it has been by no means unnoticed by other writers. A remarkable instance has recently been under my observation. A gentleman applied to me with syphilitic roseola, for which I prescribed mercurials, which caused the disappearance of the eruption in the course of ten days, but which gave him so sore a mouth that I discontinued the remedy, intending to resume it again in a short time. Several circumstances occasioned delay, when, in about three weeks, a papular eruption appeared in patches, which became covered with scales. I immediately resumed treatment, but found the greatest difficulty in producing the slightest effect either upon the symptoms or upon the gums, and it was only after the lapse of six weeks, and a trial of various mercurial preparations, and different modes of administering them, including fumigation, that the mouth was a second time affected, and the symptoms improved. Patients who have supposed themselves extremely sensitive to the action of mercury, founding their opinion upon past experience, are often surprised at the large amount which they are able to take, not only with impunity, but with decided benefit to their symptoms and their general condition, while under treatment for syphilis.

The earliest indication of the morbid action of mercury upon the mouth, which is likely to attract the patient's notice, is tenderness of the gums; this is soonest felt just back of the superior incisor teeth, and, in the lower jaw, posterior to the last molars. I always warn patients of these symptoms at the commencement of a mercurial course, and direct them immediately upon their appearance to suspend treatment until they can see me. This precaution is desira-

ble, although it sometimes leads timid persons to imagine the mouth affected long before this result has actually taken place. I have met with several instances in which the soreness attendant upon the development of a wisdom tooth has been mistaken for mercurial salivation, and various other causes may also produce tenderness of the gums, and a fetid breath. It is, therefore, always desirable for the surgeon carefully to inspect the mouth before commencing treatment, in order that he may be able to determine, at a subsequent period, how far to attribute its unhealthy condition to the influence of mercury.

Other prominent symptoms of mercurial stomatitis are a metallic taste in the mouth; a fetid odor of the breath—which, however, is not characteristic, since it may be perfectly simulated by the offensive smell proceeding from a want of cleanliness, or gums diseased from other causes; an increased flow of saliva; a sensation as if the teeth were elongated, and tenderness when they are struck together; swelling of the tongue, which bears the impress of the teeth upon its sides; tumefaction of the mucous membrane of the gums, cheeks, and lips; difficulty in talking and swallowing; enlargement of the neighboring ganglia; sometimes general febrile disturbance and great nervous irritability; in extreme cases ulceration of the soft parts, which may perforate the cheeks; loosening and detachment of the teeth; and even caries of the alveoli and of the maxillary bones.

Under the cautious method of administering mercury which is now adopted, excessive salivation is rarely induced, and even when left to itself, usually subsides in the course of a week or ten days after the suspension of treatment. Much, however, may be done to shorten its duration and alleviate the sufferings of the patient. The bowels, if confined, should be freely purged, and the action of the skin promoted by warm baths and underclothes of flannel. The most distressing symptoms are the great difficulty in swallowing, nervous excitability, and inability to sleep. Nourishment should, therefore, be administered in a liquid and concentrated form, as strong beef-tea; and rest be secured by the exhibition of Dover's powder, aided by a hot mustard pediluvium at night, which will also act as a derivative from the head. Half an ounce or an ounce of Labarraque's solution of chlorinated soda in half a pint of water forms an excellent gargle for such cases.

Although the above measures should by no means be neglected, the most direct and effectual treatment of salivation consists in the administration of the chlorate of potash. I usually order a few

drachms or an ounce of this salt in powder, and direct the patient to dissolve from one to two teaspoonfuls in a pint of water, milk and water, flaxseed tea, decoction of marshmallow, or in whatever other vehicle may be most agreeable. This solution is to be used warm, and is to be kept constantly within reach of the patient, so that he may frequently rinse his mouth with it, and afterwards swallow a portion. From one to two pints are sufficient for the twenty-four hours; and about half of this quantity, containing one or two drachms of the chlorate, should be swallowed.

It cannot be doubted that the amelioration in the symptoms which almost always takes place under the use of the chlorate, is due to the remedy and not to the mere suspension of the mercurial, since the stomatitis will often relapse if the salt be too soon discontinued. The therapeutic action of the chlorate is also proved beyond question by Ricord's experiments, which show that the stomatitis will subside under its use if the mercurial be continued, and, in many cases, even if the dose be increased; and that the chlorate may be employed as a prophylactic from the commencement of treatment in persons who are peculiarly susceptible to the morbid action of mercury, without interfering with the remedial effect upon the syphilitic symptoms.[1] This statement has been confirmed by Laborde.[2]

During the use of mercury, much may be done to prevent salivation by attention to cleanliness of the mouth, and by avoiding exposure to sudden changes of temperature and to moisture; and these precautions should be continued for some little time after the suspension of treatment. The teeth should be brushed several times a day, or the mouth be rinsed with some astringent gargle, as diluted tincture of myrrh, or equal parts of brandy and water with the addition of alum. The influence of cold and wet must not be regarded as chimerical. I have known a country physician to be profusely salivated a month after the cessation of a mercurial course, as a consequence of exposure to the rain while attending to his practice. But the apprehension which is often entertained by patients in regard to the use of cold drinks, provided other hygienic conditions be favorable, is probably groundless.

The young surgeon must not, however, suppose that salivation is the only indication that the system is fully under the influence of mercury. There exists a class of patients who, it would seem, cannot be salivated, no matter how much mercury they may take; but

[1] Ricord, Leçons sur le Chancre, p. 336.
[2] Laborde, Gaz. des Hôp., Apr. 24, 1858.

in such persons the point of saturation, if we may so call it, is indicated in other ways, commonly by loss of appetite, general malaise and depression of spirits; by diarrhœa; or by ulceration of the internal surfaces of the cheeks on a line corresponding with the free edges of the molar teeth, which may readily be mistaken for a syphilitic ulcer. With due care, however, any serious inconvenience from these symptoms can be avoided; only let it be remembered that any falling off in the general condition of the patient during a mercurial course, the supervention of diarrhœa when the remedy was for a time well borne, or any tendency to ulcerative action should be regarded with suspicion and be well weighed before treatment is farther continued.

Other morbid effects of mercury, as the eruption upon the skin (eczema mercuriale) which sometimes follows mercurial inunction; mercurial trembling, and other affections of the nervous system; mercurial spanæmia and cachexia, etc., are so infrequent at the present day, that I shall refer the reader for their minute description to the standard works upon Materia Medica, and especially to the admirable treatise of Prof. Stillé.[1] It would hardly seem possible that any physician who has been educated in the modern views of the treatment of syphilis could carry the use of mercurials to such an extent as to produce the more severe morbid effects of this mineral.

Mercury has undoubtedly been charged with many evil results of which it is entirely innocent, and it is much to be regretted that such errors have been promulgated and strengthened in the minds of a timid public by some members of our own profession. Let it be observed that I do not deny the powerful agency of this mineral for evil as well as for good, nor that it is often used unnecessarily and injudiciously, to the detriment of the general health and aggravation of the disease which it is intended to cure; but to ascribe to its employment many of the later manifestations of syphilis, as iritis, orchitis, and tertiary lesions in general, which are known to occur in cases where no mercurial has been given, and which are never met with when this mineral is administered for other diseases than syphilis, nor among those who constantly work in mercury, is an unfounded and dangerous doctrine, and one which returns upon the profession and impedes its action on occasions when this mineral is one of the greatest boons from nature to man.

Duration of Treatment.—It is hardly necessary to remark that treatment should be persevered with as long as any syphilitic symptoms remain. While these persist, specific remedies must be con

[1] Therapeutics and Materia Medica, by ALFRED STILLÉ, M. D., Phil., 1860.

tinued in doses graduated according to the effect produced and the general condition of the patient, increasing the quantity if fresh symptoms appear or old ones cease to improve; diminishing it, or suspending treatment altogether for a time, if intestinal irritation. salivation, general malaise, or decided cachexia supervene; in all cases seeking the aid of hygienic influences, and of tonics. The effect upon the symptoms is to be taken as the guage of the extent to which mercurial treatment should be carried, and it is a mistaken notion that anything is to be gained by causing salivation or any of the other pathological effects of mercury. So soon as the symptoms begin to improve, the maximum dose required for the time being has been reached; indeed, it is better then to hold up a little and diminish the quantity of the remedy, since the therapeutic action of the mineral is but a short remove from the pathological, and the latter is to be carefully avoided.

In some old and obstinate cases of syphilis, however, it is difficult if not impossible to employ mercury, either externally or internally — but especially the latter, — until the disappearance of the symptoms, without the supervention of unpleasant consequences on the part of the bowels, general condition of the patient, etc.; and in such instances I have found the mode of conducting treatment recommended by Mr. Thomas Hunt, of London, extremely valuable. This method[1] is founded upon the idea that mercury exerts its therapeutic action suddenly and within a limited period only, beyond which its effect is null or injurious. He, therefore, advises that it should be administered in short and vigorous courses, giving such doses as will most speedily affect the system until its action becomes manifest, then entirely withholding it for a time, and subsequently resuming it in the same manner, as often as may be necessary. Mr. Hunt prefers blue pill to other preparations of mercury on account of its greater activity. In the first course, he administers from two to seven grains morning and night until some improvement in the disease is manifest, and does not persist for a single day beyond this, but substitutes aperients and tonics for the mercurial. In two or three weeks he commences the second course, giving mercury in increased and, in most cases, doubled doses, to provide against the tolerance which is acquired by use. Thus he goes on with repeated and energetic courses, always aiming to produce an impression upon the disease as rapidly as possible, and stopping as

[1] On Syphilitic Eruptions, etc., with especial reference to the Use and Abuse of Mercury, by THOMAS HUNT, F. R. C. S., 2d ed., London, 1864.

soon as this effect is attained, and when all symptoms have disappeared he administers a final course as a preventive and pursues it until fetor is perceptible in the breath or the patient complains of a metallic taste in the mouth. In the later courses he often combines inunction with frequent internal doses, with or without opium, in order to obtain more speedy mercurial action. Mr. Hunt's method is especially adapted to weak and cachectic subjects in whom I have repeatedly employed it with very satisfactory results, although the occurrence of relapses in many cases has shown that the author's anticipations as to the immunity afforded by the final preventive course, are too sanguine.

In the early stages of syphilis, induration of the base of the primary sore, and more frequently that of the neighboring ganglia, will remain after the more evident symptoms of syphilitic infection have disappeared, and treatment must be continued until they also have been dissipated. No permanent relief can be anticipated unless the base of the chancre has resumed its normal suppleness, or retains only the products of simple inflammation, and unless the ganglia have lost their characteristic hardness, although these bodies will, of course, always remain perceptible to the touch, and may be somewhat larger than they were originally. When all this has been accomplished, and when no trace of the disease remains, the question comes up whether treatment should be still farther prolonged, and if so for what period, with the hope of securing immunity for the future. Upon this subject the greatest variety of opinion prevails among different authorities.

Some take as a standard the period which has already been occupied in subduing the previous symptoms, and would have the treatment still continued for half or the whole of the same length of time. Others are content with a month or six weeks, irrespective of the previous duration of treatment; while many practitioners advise a period of from six months to two years. Again, there is an equal diversity in the recommendations as to the form of mercurial to be employed, the mode of its administration, and the extent to which it should be made to affect the system; some preferring the bichloride in small doses, and never pushing it to the extent of touching the gums; others employing some more active preparation at repeated intervals, and pushing it on each occasion until the mouth is slightly affected; and others still keeping their patients upon the verge of salivation during the whole period of prophylactic treatment.

For myself, following the teaching of Ricord and with the hope

of securing subsequent immunity, I was formerly in the habit of pursuing treatment for a long period after the disappearance of syphilitic manifestations; but finding, in very many cases, that this hope was not realized, I was led to try the plan of stopping specific remedies within a few weeks after all appreciable symptoms had ceased to exist, still directing attention, however, to the hygienic condition of the patient and usually administering some form of tonic. As the result of my experience with this plan, I can confidently assert that those patients who cease specific treatment soon after the disappearance of their symptoms, do quite as well, if not better than those who continue it for a long period afterwards. They are quite as likely to be exempt from farther attacks, and if such occur, they are better prepared to meet them. In short, while losing none of my faith in the power of mercury to subdue existing symptoms, I have less confidence than formerly in its power as a prophylactic to prevent their return. I believe the ultimate recoveries which have followed, and which have been ascribed to courses of mercury continued for months or even years, have been due to the power of nature in eliminating the virus from the system, and not to the prolonged use of mercury.

In whatever mode treatment is being applied, whether internal or external, at the time all syphilitic manifestations disappear, I am now in the habit of continuing the remedy for a few weeks longer, until I can feel confident that freedom is for a time at least secured. I then place my patient upon the use of some preparation of iron, cod-liver oil, or iodide of potassium in small doses (gr. iij–v three times a day); direct him to pay the same attention as before to his general health, and to report himself from time to time for inspection. The longer the time that elapses without a recurrence of the symptoms, the better his prospect for the future; and when from eight months to a year have passed without the reappearance of the disease, the chances of its return are very small.

To those who still believe in the prophylactic power of mercury continued after the disappearance of syphilitic manifestations, I would strongly recommend its application externally, either by fumigation or inunction, as far less calculated to depress the system and better adapted to secure the end in view than its internal administration.

Iodine and its Compounds.—The therapeutic effect of iodine and its compounds upon syphilitic symptoms is in direct ratio to the duration of the disease. Although possessing little if any

power over early secondary manifestations, their action upon tertiary lesions and those of the transition stage is very decided. In deep tubercles of the cellular tissue, rupia, syphilitic orchitis, affections of the bones and periosteum, syphilitic cachexia, etc., the results of their employment are frequently almost magical. An unfortunate patient whose life has been rendered miserable for months by pains in his bones which have deprived him of sleep, by a pustular eruption upon his face which has debarred him from society, by deep ulcerations about the pharynx which have rendered speech and deglutition almost impossible and which finally threaten suffocation, or who has suffered from any other of the numerous late manifestations of syphilis, will in most cases obtain comparative ease and comfort in the course of a few days or weeks from the administration of the iodides. It would be difficult to name the circumstances under which the surgeon feels more pride in his profession, or in which he finds more conclusive evidence of his power over disease, than when he is able to recognize the symptoms which indicate the exhibition of these remedies and can watch their marvellous effects from day to day. Unfortunately the iodides possess greater power to subdue tertiary symptoms for a time than to cause their permanent removal. The disease rapidly declines and disappears under their use, but in most cases returns in a few weeks or months after their suspension; and thus the patient becomes the slave of medicine, or is obliged to resort to mercury for an effectual cure.

But these preparations are none the less of very great value. Mercury, when given at the commencement of the treatment of tertiary syphilis, cannot, as a general rule, be supported, and rarely fails to aggravate the symptoms. By the use of the iodides the patient finds almost immediate, though temporary relief from suffering; his appetite improves, he gains flesh and strength, and his system is brought into a proper condition for the administration of remedies which will prove of more lasting benefit.

The ground above taken with regard to the therapeutic effect of iodine and its compounds is at variance with that assumed by some most eminent authorities, and especially by Ricord, who considers the iodide of potassium as much a specific for tertiary as mercury is for secondary symptoms. In my own practice, however, I have rarely been able to secure permanent relief for my patients unless the former agent was accompanied or followed by the latter, and this experience coincides with that of Sir Benj. Brodie, Langston Parker, and Mr. Hunt, of Eng., and Drs. Mussey, Willard Parker,

John Watson, Wm. H. Van Buren, Blackman,[1] and other eminent surgeons of this country. Persons are frequently met with who have taken the hydriodate of potassa for years and years, and who are still obliged to continue it if they would keep their symptoms in check. They generally become familiar with its use, purchase and mix it for themselves, and take it as regularly as their daily meals. An old man is now in attendance upon the New York Eye Infirmary, whose face is deeply scarred and nose sunken from the effects of syphilis. I am informed by Dr. Geo. Wilkes, formerly surgeon of this Institution, that this man was a patient there ten years ago, when he was in the habit of buying the iodide of potassium for himself by the pound and taking the enormous quantity of an ounce a day; and I find on inquiry that he has continued its use from that time, although he has gradually reduced the amount, and now takes but about half a drachm per diem.

The observations of MM. Melsens and Guillot have proved that iodide of potassium is capable of rendering soluble mercury or any of its compounds retained within the tissues of the body and of causing their elimination through the urinary secretion, in which they may be detected by chemical analysis. In this manner, mercury which has been retained in the system is again rendered soluble, and before elimination may exercise any of its therapeutic or morbid effects. Thus iodide of potassium administered subsequently to a mercurial course has frequently been known to excite profuse salivation.

The question has been raised whether iodide of potassium by itself has any power over syphilis, and whether its therapeutic action may not be entirely explained by the facts above stated. According to this view it is only curative because it has the power of rendering active mercurial preparations which have been accumulated in the system by previous treatment; while others who believe that tertiary syphilis is an effect of mercury have ascribed the action of iodide of potassium to the elimination of this mineral and the consequent removal of the supposed cause of the disease. Neither of these suppositions will bear the test of examination. Cases of tertiary syphilis in which mercury has not previously been given, and in which, therefore, the independent action of iodide of potassium may be tested, are not common; but a sufficient number have been met with to prove that this agent does not play so secondary and insignificant a part as has been attributed to it. Of 195

[1] See BLACKMAN'S VIDAL on Venereal Diseases, 1st ed., p. 320.

cases of syphilis successfully treated with iodide of potassium by Hassing, of Copenhagen, in 70 no mercurial treatment whatever had been employed.[1]

A woman recently entered Nélaton's wards with numerous exostoses upon the tibias, the femoral bones, the bones of the forearms and the thoracic fibro-cartilages, which were attended with such severe pain as totally to deprive her of sleep. She stated that she had had this disease for three years, and had never received any treatment whatever. The iodide of potassium was administered in the dose of fifteen grains a day, and by the third day she was able to pass a quiet night, and at the end of a week the osseous tumors had lost their sensibility and resolution had commenced.[2] This case can leave no doubt that the administration of the iodide of potassium may effectually control tertiary syphilis when mercury has not been previously given. This conclusion, however, does not conflict with the belief that its therapeutic action may sometimes be due in part to the liberation of mercury.

The solubility of iodide of potassium enables it to be administered in any aqueous or alcoholic mixture, while its deliquescent properties poorly adapt it for the pilular form. Five grains three times a day is the usual dose with which to commence treatment in an adult, and if the case be properly selected, marked improvement will generally take place within a week. In old cases of syphilis, however, this quantity is often insufficient, and it may be necessary to increase the dose to a drachm, and, in exceptional cases, to two drachms or more per diem. When the symptoms appear to indicate the use of the hydriodate, the case should not be pronounced intractable to this remedy unless a trial has been made of full doses and these have been found to be without effect. Ricord, who was one of the first to follow Wallace, of Dublin, in the use of this agent, and whose experience with it has probably been greater than that of any other surgeon, administers from fifteen grains to a drachm and a half per diem, and rarely exceeds the last named quantity. His colleague at the Hôpital du Midi, M. Puche, frequently employs an ounce and a half (50 grammes) in the twenty-four hours, and states that he has rarely observed any bad effects; this practice, however, is not deserving of imitation.

The following are convenient formulæ:—

℞. Potassii iodidi ℥ss.
Aquæ cinnamomi ℥ss.
M.

[1] British and Foreign Medical Rev., Oct., 1845, p. 482.
[2] Gaz. des Hôpitaux, Jan. 28, 1860.

Seven drops of this solution contain nearly five grains of the iodide.

℞. Potassii iodidi ʒij.
Aquæ ℥iij.
M.

A teaspoonful three times a day.

The action of the iodide of potassium is increased by combination with muriate of ammonia, which is a favorite addition with my venerable friend, Dr. John P. Batchelder, of this city.

℞. Potassii iodidi,
Ammoniæ muriatis, āā ʒj.
Tinct. cinchonæ comp. ℥iv.
M.

A tablespoonful three times a day.

Experience shows that the most favorable time for the administration of the iodide of potassium is half an hour or an hour after eating, although Dr. Budd remarks that it should be taken fasting, "lest it be decomposed by the hydrochloric acid of the gastric juice." It not unfrequently excites griping pains in the bowels, which may be avoided by the addition of a syrup containing tannic acid, as the syrup of cinchona or of orange peel.[1] The addition of a small quantity of tannic acid to solutions of the iodide in a syrup which does not contain tannin answers the same purpose. The following formula is employed by Ricord and Nélaton:—[2]

℞. Potassii iodidi ʒj.
Syrupi corticis aurantii ℥vj.
M.

Dose.—A tablespoonful.

Dr. Durkee states that he is in the habit of combining the iodide of potassium with carbonate of ammonia, which he thinks renders this substance more agreeable and efficient. He employs the following formula:—[3]

℞. Ammoniæ carbonatis ʒiss.
Potassii iodidi ʒiij.
Syrupi sarsæ comp.,
Aquæ āā ℥iiss.
M.

Dose.—One drachm three or four times a day.

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[1] Boinet, Traité d'Iodothérapie, Paris, 1855, p. 102, and L'Union Méd., 1858, p. 487; also same journal for March 6, 1860.

[2] Richelot, L'Union Méd., Feb. 28, 1860.

[3] Gonorrhœa and Syphilis, p. 325.

The iodide of sodium[1] and the iodide of ammonium[2] have been recommended as substitutes for the iodide of potassium by Dr. Gamberini, of the Hospital of Saint Orsola, Bologna. In the few cases in which I have employed them, they have proved so disagreeable to the taste that my patients have been unwilling to continue them.

The iodide of iron cannot be said to possess any special antisyphilitic power, but is an extremely valuable tonic in cachectic or chlorotic subjects either with or without the iodide of potassium. I am in the habit of employing it frequently, especially towards the close of treatment and after the use of mercury. Blancard's pills are the most convenient form of administration, or the liquor ferri iodidi may be employed. As the iodide of iron is frequently given to women who pride themselves upon their complexion, it is well to know that it sometimes gives rise to papular, tubercular, and furuncular eruptions, like other compounds of iodine. This fact is denied by Mr. Langston Parker,[3] but I have met with a number of unquestionable instances in my own practice from the use of Blancard's pills, though I cannot recall any when the syrup has been employed.

The contra-indications to the use of iodide of potassium are acute or chronic inflammation of the digestive organs, plethora, and a disposition to hemorrhages. A few persons are entirely insensible to its influence, and it is useless to persist in its employment if a fair trial, commencing with moderate doses and gradually increasing to large ones, prove unsuccessful.

In cases adapted to its use, the effect of the iodide of potassium, if given in sufficient quantity, is usually perceptible in the course of a week. The appetite increases, the digestive powers improve, and the patient rapidly gains in flesh and strength. Grassi's analyses of the blood show that this remedy possesses the power of increasing the proportion of blood-corpuscles in the chloro-anæmia of early secondary syphilis, and experience proves that it is one of the best tonics that can be used at this stage of the disease.

Iodide of potassium rarely occasions such unpleasant effects as to demand more than a mere temporary suspension of its employment. Its morbid action is chiefly manifest upon the various mucous membranes. Some patients, shortly after commencing its use, are seized with coryza, which is sometimes quite severe, and accompanied with acute pain in the frontal sinuses; others are attacked with œdema

[1] Dublin Quarterly Journ., No. 28, Nov., 1852. [2] Gaz. des Hôp., Dec. 1, 1858.
[3] Modern Treatment of Syphilitic Diseases, Am. ed., Phil. 1854, p. 258.

of the conjunctiva oculi and swelling of the lids; irritation about the fauces and bronchitis are occasionally met with, and even œdema of the glottis. Gastro-intestinal irritation is a frequent symptom which has already been adverted to. Loss of vision, apparently dependent upon sub-retinal effusion, has been observed in a few rare instances. Salivation sometimes occurs, but is never as severe as that occasioned by mercury, nor is it ever attended by ulceration like the latter. It has been asserted that iodide of potassium produces atrophy of the breasts and of the testicles; but this is denied by Ricord, who states that he has accurately measured the scrotal organs before and after treatment, and has never found any diminution in their volume, unless they were affected with syphilitic orchitis, which generally terminates in atrophy. Iodide of potassium may hasten this result, when it would inevitably have taken place without it, but cannot produce it in healthy organs. Langston Parker also coincides with Ricord in this opinion.

One of the most frequent morbid effects of this remedy consists of various eruptions upon the integument, generally in the form of papules or pustules resembling acne, and often of furuncles or boils. They are quite common about the neck and face, where they present an unsightly appearance and are the source of much annoyance to patients who frequent society; and also upon the trunk and upper extremities. The eruptions produced by the administration of iodide of potassium and other compounds of iodine have been carefully studied by Dr. H. E. Fischer,[1] of Vienna, who divides them into the erythematous, papular, tuberculo-pustular, and eczematous.

In the *erythematous form*, the skin, and especially that covering the forearm, assumes an intense red color, which is sometimes isolated in points, and at other times covers the whole surface; the temperature of the part is also heightened. This erythema disappears if the treatment be suspended, or, if the latter be continued, runs into the following form.

The *papular*, which is by far the most common form, may appear over the whole integument, but is chiefly met with upon the extremities and abdomen. The papules are but slightly elevated above the surface; are of an intense red color, which disappears on pressure; measure from half a line to two lines in diameter, and resemble urticaria; the larger papules are surrounded by a red areola, and are sometimes isolated and at other times in groups. They are

[1] L'Union Médicale, Jan. 31, 1860; from the Wien Medizin. Wochenschrift

developed without any general febrile disturbance, have no injurious effect upon the general system, and disappear without desquamation upon the suspension of the iodide.

The *tuberculo-pustular form* is rarer than either of the preceding, and is chiefly met with in strumous subjects. A red spot, attended with itching, is first observed, which is soon transformed into a small tubercle, with or without an areola; in most cases a vesicle or pustule forms on its summit, which sometimes bursts and discharges its contents, and at other times dries into a scab, which falls off, leaving only the tubercle behind it. The tubercles are of a bluish color, throw off scales in the process of resolution, and are very slow to disappear, even if the iodide be suspended. They leave behind them stains of a bluish-red color, which are often indelible. Intermediate forms, consisting of vesicles, pustules or boils, have been noticed by several writers.

The *eczematous* variety, which closely resembles ordinary eczema, is very rare. It most frequently affects the hairy scalp and the neighborhood of the scrotum, and soon disappears on stopping the iodide. M. Mercier[1] describes a case in which moderate doses of iodide of potassium, upon two occasions in the same person, brought out an eruption of eczema rubrum over the whole body, attended by severe fever and dyspnœa, and so copious an exudation of fluid that the bed on which the patient lay was completely wet through.

In all the cases upon which these observations were made, the preparation of iodine employed was either the iodide of potassium or of sodium. The eruptions did not appear to depend upon the quantity administered, since they were often produced by small doses, and were frequently absent when the remedy was pushed to iodism.

Mr. Langston Parker has described a hard, tubercular condition of the tongue, which is sometimes cracked and fissured, consequent upon the long-continued use of iodine.[2] This affection closely resembles syphilitic tubercles, from which it may be distinguished by its disappearance soon after the discontinuance of the iodine.

In addition to the morbid effects already mentioned, iodide of potassium in large doses sometimes gives rise to a combination of symptoms known under the name of "iodism," and consisting of a sensation of oppression in the head, tinnitus aurium, neuralgia,

[1] Observations Nouvelles sur le Traitement des Valvules du Col de la Vessie, Paris, 1847, and L'Union Médicale, Feb. 11, 1860.

[2] Provincial Medical and Surgical Journal, No. 3, 1852; also, Syphilitic Diseases, p. 211.

spasmodic action of the muscles, impaired voluntary motion, and sluggishness of the intellect.

VEGETABLE DECOCTIONS AND INFUSIONS.—Decoctions and infusions of sarsaparilla, saponaria, water-dock, stillingia, and other vegetable substances have at times enjoyed considerable reputation with the profession for the cure of syphilis, and are still held in high repute by the public. When used alone they are found to be entirely destitute of anti-syphilitic properties, and when given in combination with mercurials and iodide of potassium, do not appear to add to the effect of the latter. This statement coincides with the opinion of most surgeons[1] who have had the largest experience in their use, and has recently been confirmed, so far as regards sarsaparilla, the reputation of which has exceeded that of all the others, by a series of careful experiments conducted by Sigmund, of Vienna, who concludes that this substance does not exercise the slightest perceptible influence on the course or termination of syphilitic diseases.[2] Whatever virtues are possessed by these substances can only be ascribed to their influence as tonics, stomachics, diuretics, or diaphoretics, to which the ordinary mode of their administration in a large amount of fluid greatly contributes. When employed with these purposes in view they may prove useful adjuvants of mercury and iodide of potassium, but alone are unworthy of confidence.

The ordinary decoctions and infusions are very bulky, and their preparation not always convenient; I am therefore in the habit of using Thayer's fluid extracts, which I have found very reliable. A teaspoonful of the compound fluid extract of sarsaparilla, prepared by this chemist, may be mixed with a tumblerful of warm water at the time of using.

Zittman's decoction (see U. S. Dispensatory) contains an appreciable amount of mercury, but acts chiefly as a cathartic and diaphoretic. The large doses in which it has been recommended, a pint of the stronger preparation in the morning, and a quart of the weaker at night, can rarely be borne without producing violent purging. I have employed it with good results in some inveterate cases of syphilis, giving from eight ounces to a pint of the strong preparation in the course of the day, and aiming to produce from three to five discharges from the bowels. In some instances it has had a very marked effect in increasing the appetite and improving the general condition of the patient.

[1] See STILLÉ's Materia Medica, ii., p. 948.

[2] British and For. Med.-Chir. Rev., Am. ed., July, 1860, p. 182.

NITRIC ACID.—Nitric acid was formerly recommended by Alyon, and others, for the treatment of syphilis, and is still a favorite remedy with the homœopaths. I have employed it as a tonic with satisfactory results in the late stages of syphilis when mercury was inadmissible, but the iodide of potassium is, in most cases, more reliable.

CHAPTER VII.

TREATMENT OF SYPHILIS BY REPEATED INOCULATION.

ABOUT the year 1844, before the distinct nature of the chancroid and syphilis was known, M. Auzias (Turenne) undertook a series of experiments to test the accuracy of the doctrine advanced by Hunter and Ricord, that syphilis is not communicable to the lower animals. By protecting the inoculated points in such a manner that the animal could not lick them and thus remove the virus, he was able to produce local ulcers with a soft base upon monkeys, cats, rabbits and horses; but neither in his experiments nor in those of others who followed him, were general symptoms ever developed, showing that the system was not contaminated with the syphilitic virus and confirming the statement of Hunter and Ricord. Moreover, there is reason to believe that the virus employed in many at least of these inoculations was the chancroidal and not syphilitic, since matter was taken from the sores developed upon the animals and inoculated on four occasions upon the person of M. Robert de Welz, of Würzburg, with the effect of producing only chancroids. Even supposing that Auzias did in some instances employ the secretion of a chancre, it is none the less true that he produced merely a local sore and that there was no absorption of the virus into the system.

M. Auzias, while performing these experiments, observed that the first ulcer inoculated upon an animal was more rapidly developed, was of a larger size, secreted a greater quantity of matter, was surrounded by more intense inflammation, and was more persistent than the second; that the second bore the same relation to the third: the third to the fourth, and so on, and that finally a period arrived when further inoculations entirely failed. We now know that this was the result of over-stimulation of the skin, which produced a temporary loss of reactive power, in the same manner as a part of the human body repeatedly rubbed with croton oil will finally lose its susceptibility to the irritant to such a degree as to cease to develop pustules. Auzias, however, who thought that he was inoculating

the syphilitic virus and who believed that at each inoculation a fresh portion was absorbed, ascribed the immunity to saturation of the system with the poison; when no more could be taken up, as he thought, he said that the animal was "syphilized," and the process by which the result was attained he called "syphilization."

Reasoning upon this basis, Auzias inferred that the same result could be accomplished in man; that the human system could be so saturated with the syphilitic virus by repeated inoculation that any farther application of the poison would prove innocuous; and in 1850 he gravely proposed to the French Academy, not only to employ repeated inoculations for the cure of syphilis, but to "syphilize" the greater part of mankind in order that they might never have syphilis!

Such is the early history of that modern treatment of syphilis, misnamed "syphilization." The proposition of Auzias to employ the process as a prophylactic soon fell to the ground from its own weight of absurdity; but repeated inoculations for the cure of syphilis were undertaken by Sperino, of Turin, in 1851, and have since been practised, and are still being practised, on a large scale, by Dr. Boeck and others, in Sweden and other portions of the north of Europe.

The *modus operandi* of this method is very simple. "The inoculations are performed first on the sides of the thorax, then on the arms and lastly on the thighs. Six such punctures are made every three days in symmetrical positions, the matter for each inoculation being always taken from its predecessor as long as it takes effect, a fresh supply being only used when the former has entirely lost its force." More frequent or more numerous punctures are not considered desirable, since it is stated that when the process is carried on with great rapidity, immunity is attained before the syphilitic symptoms are cured.

Boeck never resorts to inoculation for primary syphilis alone, regarding it as uncertain whether general symptoms will follow, and limits the practice to the secondary and tertiary forms of the disease. He states that it is only the first twenty or thirty sores which attain any considerable size; that the subsequent ones become smaller and smaller; and that finally inoculation of the matter which was first employed ceases to have any effect whatever when implanted beneath the epidermis. When immunity to the first virus is obtained, he takes fresh matter from another source, with which he is able to produce a new series of sores, but they are never so large nor can as many be made as in the preceding series.

A third or even a fourth or fifth fresh quantity of matter may succeed in exciting a few insignificant pustules, but finally complete and permanent immunity is obtained, when matter from any source whatever has no more effect than so much water. We shall see hereafter, that this statement of Dr. Boeck is denied by Dr. Faye and others. Boeck states that in a few instances he has been able to effect a permanent cure of syphilis with matter from one source alone.

Boeck resolutely pursues the treatment in spite of any alarming symptoms which may supervene. He regards the occurrence of phagedena as an indication for persevering in the inoculations, and even looks upon intercurrent iritis without apprehension, and says that it disappears spontaneously and without any special treatment. In respect to the results of this practice, Boeck divides patients into two classes, those who have been exempt from all previous treatment, and those who have already taken mercury. He has found that the former without a single exception can be cured by inoculation alone. The latter do not improve with the same uniformity; relapses frequently occur, and it is often necessary to administer preparations of iodine in conjunction with the treatment by inoculation.

Boeck resorts to inoculation in the syphilis of infants as well as of adults. The effect upon the general health is said to be decidedly beneficial. Patients are allowed to eat and drink what they please, and to continue their usual avocations. Weak subjects never fail to gain in flesh and strength, and after the treatment is completed are as strong and healthy as they were before they were attacked with syphilis.

At the time when his communication to the Medico-Chirurgical Society of Edinburgh was written, Boeck had met with only three relapses in one hundred cases, and these were cured by a second course of treatment, in which but a small number of inoculations was requisite. The average duration of treatment in ordinary cases was about six months, and in the more severe cases of inveterate syphilis from seven to eight months.

Such are the advantages and the results claimed for the inoculation cure of syphilis by one of its chief advocates; and it must be confessed that these claims are sustained by the testimony of many impartial observers, among whom may be mentioned the editor of the Dublin Quarterly Journal of Medicine[1] and the author of an

[1] Dublin Quarterly Journal of Medical Science, Feb. 1857, p. 77.

able article upon this practice in the Medico-Chirurgical Review,[1] each of whom has visited either Christiana or Stockholm and witnessed the inoculations of Dr. Boeck and Prof. Malmsten. M. Melchior Robert,[2] the late distinguished writer on Venereal, of Marseilles, has also published five successful cases and has declared himself a convert to the new doctrine; and Diday[3] admits that syphilitic symptoms disappear under repeated inoculations of the chancroidal virus, but only, as he maintains, in consequence of depuratory action, and not from absorption of the poison.

The question now arises, how are the facts above stated to be explained? Auzias (Turenne) and Sperino both believed that the therapeutic effect of repeated inoculation was due to the absorption of the virus and the saturation of the system with the poison; but as Dr. Faye remarks, "no system of physiology or pathology has as yet made us acquainted with a chronic zymosis or blood-poisoning, which, under a constant reintroduction of the poison, operates in one case beneficially and in another is followed by the most serious consequences;" and this theory was so contrary to all rules of pathology that it was a great obstacle to the speedy reception of the new doctrine. Boeck was unwilling to adopt this theory, to which he objected that if saturation really took place the symptoms would become worse instead of better. He did not, however, attempt to offer a substitute, and confessed that he adopted the practice on empirical grounds alone. It should be observed that neither of these three authors admits a distinction between the chancroidal and syphilitic virus.

The first approach to the true explanation of the facts observed was made by Prof. Faye, who, as before stated, denied the prophylactic power of this method, and asserted that the alleged immunity to the virus was only "a temporary immunity of the over-stimulated skin, and that the cure of the syphilitic symptoms was due to the depuratory action of the sores excited by successive inoculations." This theory, which was much more in accordance with our general ideas of pathology than the one advanced by Auzias and Sperino,

[1] British and Foreign Med.-Chir. Rev., April, 1857, p. 819 and 824. I desire to acknowledge my indebtedness for much that is contained in the present section to this review, and especially to another by the same author in the number of this journal for January, 1859. In the latter, the able writer abandons the theory that the system becomes saturated from absorption of the virus, and adopts the opinion of Dr. Danielssen, that the disappearance of the symptoms is due to prolonged suppuration.

[2] Pamphlet in 8vo., pp. 45, Marseilles, 1859.

[3] Gaz. Méd. de Lyon, No. 19, 1860.

was yet deficient in that it was not sustained by any known facts, and it consequently failed to attract the attention it deserved. The proof which was wanting has since been supplied by Danielssen, whose experience with inoculation in lepers not affected with syphilis has conclusively shown that no absorption of the virus takes place, and consequently that the cure of syphilitic symptoms cannot be due to saturation of the system with the poison. He gives the histories of six cases in which inoculations were performed upon persons untainted with syphilis with the virus commonly used, but in which the treatment was not pushed to the extent of so-called immunity, and in not one of the six did any general symptom appear.

With reference to these cases, Danielssen remarks: "It appears from the above details, that neither one ulcer, nor two, nor three, nor six, nor thirty-six, nor one hundred and thirty-six have in the preceding cases induced secondary syphilis, and that, therefore, the direct operation of the inoculations has been exclusively limited to the spot where the sores had shown themselves. If such be the case, we are justified in assuming that no greater number will produce a different result. And this is confirmed by our experience; for with one exception, to which we shall subsequently allude, not one of those individuals, previously free from all syphilitic taint, whom I have subjected to the treatment, have been affected by secondary syphilis; nor have they shown any signs of the existence of the venereal diathesis in their systems. Nor, in those already affected with syphilis, have I observed under inoculation the slightest evidence of their having imbibed the poison afresh. So far from seeing in repeated inoculation a new physiological fact, as Boeck denominates it, I have, on the contrary, found it confirm a long-established axiom, viz., that the chancroid does not affect the system, and consequently does not produce general syphilis. Among the many thousand artificial ulcers that I have seen, I have not observed one (with a single exception) which was not of this character, both in my own practice and in that of my colleagues, and as inoculated on every part of the body. Even on the face, the chancroid followed inoculation, contrary to Ricord's experience, who had always observed the indurated chancre there."[1]

The exceptional case referred to in the above remarks is highly important, since it strongly confirms the position here assumed. Inoculation had been performed upon a leper with the virus of the chancroid to the extent of nearly 400 times, when the secretion of

[1] Medico-Chirurg. Rev., Jan., 1859, p. 98.

an indurated chancre was accidentally inoculated. The inoculated point healed, but *a month afterwards an indurated sore appeared followed by unmistakable signs of secondary syphilis*, showing that the previous inoculations with the chancroidal virus, which had been strictly local in their action, had afforded no protection whatever against true syphilis.

Danielssen's conclusions as to the kind of virus which has commonly been employed are borne out by an examination of the writings of Boeck and others. Boeck, for instance, states that the best matter for the purpose is that derived from a sore attended by a suppurating bubo; but a venereal sore with this accompaniment is generally a chancroid and not a true chancre. Again, all observers state that a pustule is so far developed by the second or third day after inoculation, as to furnish matter for fresh inoculations; but the absence of a period of incubation and a pustular form at the outset are characteristics of the chancroid and not of the chancre. The value of this testimony from Boeck is increased, because given unconsciously by one who does not recognize the distinction between the two kinds of sore. Yet, after all, there is no necessity to search for these minor indications to enable us to determine what species of virus has been employed in successful inoculations of persons already infected with syphilis, since the experiments of Ricord, Fournier, Rollet, and many others, have conclusively shown that under these circumstances those only, as a general rule, can succeed which are performed with the secretion of the chancroid.

Since the above was written we find it stated that "latterly matter has been taken only from infecting chancres."[1] Now this statement, opposed as it is to the experience of the authors just cited, cannot be received without farther testimony; but even granting it to be true, it does not follow that the virus undergoes absorption, since Diday[2] has shown that the implantation of the syphilitic virus upon a person already infected may produce a local sore without constitutional reaction; and there can be no doubt that the inoculations act only in a depurative manner like those of the chancroidal virus.

In support of the idea that repeated inoculation cures syphilis by the depuratory action it sets up, Danielssen calls attention to the fact that in tertiary syphilis, nature herself often produces deep

[1] Revue of BIDENKAP, Aperçu des Différentes Methodes de Traitement Employés à l'Hôpital de l'Université de Christiania contre la Syphilis Constitutionelle. Medical Times and Gazette, Oct. 31, 1863, p. 468.

[2] See Chapter I., Part 3, of this work.

suppuration, under which, if the strength holds out, all secondary symptoms disappear. Moreover the beneficial action of cathartics, diaphoretics and diuretics in many cases of syphilis is well known. Finally, it is stated on apparently good authority, that Lindwurm and Hjort have used inunction with tartar emetic in the treatment of syphilis with the effect of obtaining more rapid cures than by the inoculation of chancroidal matter.[1]

I have had no practical experience with the inoculation-cure of syphilis, which has never been thoroughly tested, so far as I am aware, in this country. With the amount of testimony in its favor now in our possession, there can be no reasonable doubt that it is an efficacious mode of treatment; at the same time it must be conceded that the practice is so repugnant to the feelings that it will not be generally adopted at least in America, until its superiority over all other methods is conclusively proved.

[1] Revue in the Dublin Quarterly Journal of Medical Science, May, 1861, p. 339.

CHAPTER VIII.

SYPHILITIC FEVER; STATE OF THE BLOOD; ENGORGEMENT OF THE LYMPHATIC GANGLIA.

THE appearance of general syphilis is in most instances preceded by certain symptoms, which resemble those that usher in the exanthemata, and which have been called "the syphilitic fever" and, by Diday, "syphilitic prodromes." Bassereau met with them in 143 of 199 cases of syphilitic erythema, and in 34 of 50 cases of syphilitic papules; and their apparent absence in at least a portion of the remaining cases is attributed by this surgeon, either to the fact that they were overlooked, or to the administration of mercury for the primary sore. Out of 40 cases of general syphilis observed by Diday in which mercury had not previously been given, these prodromes were present in 37. Victor de Meric is inclined to doubt their constancy, but I have certainly met with them in the great majority of cases of early secondary symptoms in persons who have not been subjected to treatment.

Although these symptoms usually precede by eight or ten days an early secondary eruption, it is impossible to regard them as mere forerunners of the latter, since they frequently continue after the eruption appears, and in some cases commence at the same time or even follow it. They never occur alone without being followed by other manifestations of syphilitic poisoning; are most common in connection with the first outbreak of secondary symptoms, but may accompany, usually in a less degree, a second or third attack.

These symptoms consist chiefly of headache, pains resembling neuralgia or rheumatism in various parts of the body, and a general feeling of malaise or listlessness. The patient is depressed in spirits; has a pale, sallow, and haggard look; is disinclined to attend to his ordinary occupation; and loses flesh, although he may eat his usual quantity of food. He also suffers from headache, which may be nocturnal, but which most frequently, unlike the cephalalgia of tertiary syphilis, recurs in paroxysms of considerable severity without reference to the period of day or night. It is

sometimes diffused over the whole cranium, and at others confined to the frontal region. In some instances periodical attacks of a febrile character are met with, consisting of a chill followed by a hot stage and sweating, occurring with great regularity at a certain hour of the day, generally towards evening, and hence liable to be mistaken for intermittent fever. Indeed, several cases in which this mistake has been made, are reported by Bassereau and Yvaren.

The "pains" belonging to this category of symptoms are frequently nothing more than a mere sensation of stiffness of various parts of the body, as of one or more joints, the neck, the back, the calves of the legs, etc. Motion of the part is perhaps attended by actual pain, but this subsides as soon as quiet is resumed. In other, but less frequent instances, pain which is more or less constant and independent of motion, is felt in the bones, chiefly in the neighborhood of the articulations. The larger joints of the upper and lower extremities are most frequently attacked, and in rare cases motion is rendered difficult and painful from inflammatory effusion. Bassereau relates a case occurring in Ricord's wards, in which the elbow joint was swollen, red, and incapable of extension, and which a young surgeon had mistaken for a dislocation and attempted to reduce. In most cases, however, there are no symptoms of local inflammation, except perhaps slight tenderness on pressure, and the pain passes from joint to joint, or is felt in other parts of the body, as the back of the neck, the lumbar region, upon the sternum, etc., and occasionally the continuity of the bones is involved.

In some cases the digestive functions are disordered; the appetite is diminished, the tongue coated, and the patient is attacked with nausea and diarrhœa. In others, these symptoms are absent and the appetite may even be inordinately increased. Epistaxis, œdema of the lower extremities, palpitations, and a *bruit de souffle* accompanying the first sound of the heart and audible both in the cardiac region and over the carotids, have also been noted.

According to Bassereau, these symptoms generally become more severe and persist for some time after the appearance of the eruption, though in some instances they suddenly cease upon the outbreak of syphilitic erythema or papulæ, or diminish and gradually disappear in the course of one or two weeks. They are not benefited by mercury, but, on the contrary, are increased if this agent be used to excess; and this fact would seem to indicate that they are not directly dependent upon syphilitic poisoning. Diday believes that they are due to the chloro-anæmia which obtains at this period; at any rate, they are best treated by the administration of

iodide of potassium in combination with iron. These remedies will not control the secondary symptoms which may coexist; but the direct treatment of the latter may be deferred until the syphilitic prodromes have disappeared.

STATE OF THE BLOOD.—A series of analyses of the blood performed by M. Grassi under the direction of Ricord, shows that this fluid undergoes a material change in the early stage of syphilis, consisting chiefly in a diminution of the blood corpuscles, which, on an average, amounted to a loss of one-seventh, and, in one instance, to one-half of the usual number. Under the administration of iodide of potassium the number of the blood corpuscles was found to increase; but no improvement took place from the use of mercury. This chloro-anæmia is confined to the early stage of syphilis; the blood soon recovers its normal composition and retains it throughout the whole course of the disease unless syphilitic cachexia supervenes. Though foreign to our present subject, it may be mentioned incidentally, that the blood of persons affected with chancroids was shown in a second series of analyses by Ricord and Grassi to remain unchanged; and thus these experiments, which were performed before the question of the duality of the chancrous virus had been mooted, are confirmatory of the distinction which is now recognized between the chancroid and syphilis.[1]

ENGORGEMENT OF THE CERVICAL GANGLIA.—A very important symptom of the early stage of syphilis, and one which the surgeon should never fail to look for in cases of difficult diagnosis, is engorgement of the lymphatic ganglia in various parts of the body, and especially those situated upon the lateral and posterior portions of the neck. We are not here speaking of the induration of the ganglia in anatomical connection with the primary sore—the indurated ganglia, which assume their cartilaginous hardness about the same time as the base of the chancre. The symptom referred to is an engorgement—not induration—of glands at a distance from the point where the virus entered the system, and first appears some six or eight weeks after the chancre in conjunction with other early secondary manifestations.

This symptom is present in a large majority of cases at this stage of the disease. Ricord speaks of it as "perhaps the most constant, the earliest, and the most characteristic symptom of constitutional

[1] RICORD, Leçons sur la Chancre, 2d ed., p. 184.

syphilis."[1] Bassereau[2] found it in ninety per cent. of all the cases of syphilitic erythema which came under his observation; and in most of the exceptional cases the patients had taken mercury or were not seen for some time after the eruption appeared. It is an early syphilitic symptom, and occurs, if at all, within a year after contagion. Ricord states that it is rarely seen in persons who contract syphilis after forty years of age, though Bassereau met with one case in a man aged sixty-three, and another in one aged seventy-four; from which it would appear that this rule is by no means invariable.

The glands most frequently affected are those situated along the upper two-thirds of the posterior border of the sterno-cleido mastoideus muscle; but those on the back of the neck beneath the occiput, and one just posterior to the ear and over the mastoid process may also be involved. All the glands in the regions mentioned are not, however, implicated in the same person; the number is frequently but one or two, and rarely exceeds six or eight. In a state of health these bodies can with difficulty be detected; but, when enlarged by syphilis, they may attain the size of a bean or almond, and are often so prominent as to be recognized by the sight as well as the touch, and even to attract the notice of the patient's unprofessional associates. As a general rule, their number and size correspond to the extent and severity of the neighboring eruption upon the scalp.

Other glands besides those of the neck may be engorged in the same manner. Sigmund has especially insisted upon enlargement of a lymphatic gland situated between the biceps and triceps muscles just above the internal condyle of the humerus, where I have often observed it, although I do not believe it to be as constant as Sigmund's remarks would lead one to suppose. Bassereau has found the glands of the axilla affected, but only in case there was a papular or pustular eruption in the neighborhood of the shoulder. The submaxillary ganglia are also not unfrequently tumefied, when the throat is the seat of syphilitic angina or when the mouth is made sore by the use of mercury.

This engorgement of the ganglia almost invariably terminates in resolution. In one case only, so far as I am aware, has suppuration been known to take place. This occurred in a patient, aged 30, of a scrofulous habit, under the care of Bassereau, in whom two collec-

[1] Iconographie, Remarks on the case figured in Plate XLV.
[2] Op. cit., p. 68.

tions of matter were formed in the cellular tissue around the gland, attended by severe febrile excitement and requiring puncture.

Some difference of opinion has been entertained as to the question whether this engorgement is necessarily dependent upon a neighboring eruption upon the scalp or integument. Ricord believes that it is not, and states in support of his opinion that it often occurs before the slightest trace of an eruption is visible; and to meet the objection that a pustule of ecthyma might be concealed in the hair and escape notice, this surgeon has repeatedly shaved the head and proved the scalp to be intact. Admitting, however, that the engorgement of the glands precedes the eruption, it does not disprove the connection between the two, which is rendered probable by the correspondence in their intensity; and swelling of the submaxillary glands, as is well known, is often anterior to an eruption of erysipelas upon the face. Diday is confident that engorgement of the ganglia does not exist without the presence of some affection of the neighboring integument or mucous membrane, and that it corresponds in intensity with the severity of the latter. For instance, the epitrochlear gland is always most enlarged upon whichever side syphilitic squamæ upon the hand are most marked.

CHAPTER IX.

SYPHILITIC AFFECTIONS OF THE SKIN.

SYPHILITIC are distinguished from other eruptions by certain peculiarities, no one of which by itself possesses absolute value, but several of which combined are generally sufficient to establish the diagnosis.

The *color* of a syphilitic eruption will often indicate its origin. No very definite idea of this color, however, can be conveyed by words. To be appreciated, the eye must be educated to detect it upon the living body, and the student should neglect no opportunity to compare this and other objective symptoms of specific eruptions with those pertaining to their congeners of different origin. The older writers on venereal compared it to the cut surface of a ham;[1] it is now commonly known as the *copper color;* but both these comparisons fail to convey a perfect idea of the exact hue that is intended. It is best described as a reddish-brown with a slight admixture of yellow, which in many cases is modified by the natural color of the skin and by the age of the eruption.

The copper color of syphilitic eruptions, however, is by no means constant, and may be simulated by various forms of skin disease which are not dependent upon the syphilitic virus. Thus it is never seen in mucous patches, which are either red or of a grayish white hue. It is absent in most cases of syphilitic erythema at the commencement of the eruption, and only appears as the blotches begin to fade away; and, as a general rule, in nearly all syphilitic eruptions, the copper color is less marked at an early than at a late period. Again, the cicatrices of lupus, acne, and variola, may assume a reddish-brown color which is readily mistaken for the copper color of syphilis. In spite of these various sources of error, which with care may generally be avoided, the peculiarity referred to is one of the most valuable means of distinguishing syphilitic eruptions from those of simple origin.

[1] "Secate per transversum pernam, talis est color pustularum sine cortice." Gabriel Fallopius.

A *circular form*, although frequent, is less constant in syphilitic eruptions than the assertions of some authors would lead us to believe. It is often absent in the erythematous and papular eruptions of the early stage of syphilis, and is chiefly confined to the pustular and tubercular forms which appear at a later period. It is also assumed by lepra, herpes, and other eruptions of non-specific origin.

Cazenave has especially insisted upon the thinness of the scales, and upon the thickness, greenish color, and tendency to split, of the scabs; and Biett upon the narrow whitish fringe which often surrounds each patch of a syphilitic eruption, and which is merely the remains of the exfoliated epidermis; but these signs are unreliable.

Those syphilitic eruptions which are attended by ulceration, as impetigo, rupia, ecthyma, and tubercles, are often arranged in circular groups; their cicatrices, as a matter of course, assume the same form, and are, moreover, of a dirty brown or bronzed color, which gradually fades away, and gives place to a dull white. Within these circles there is generally a portion of the integument which has escaped ulceration, and the presence of isolated depressions due to distinct pustules or tubercles upon this portion of sound skin, or around the outer border of the circle, is highly characteristic of the scars of syphilitic origin. Ordinary lupus produces cicatrices which are somewhat similar, but the tubercles are so closely approximated that the scars run into each other, and are also less deep than those just referred to.[1] In general, the cicatrices of syphilitic eruptions retain, for some time, the copper color of the preceding lesion, but this gradually disappears.

The syphilodermata are very persistent, but so also are cutaneous eruptions of non-specific origin, and in this respect these two classes may at first sight appear to be entirely identical; and yet there is a difference, for certain affections belonging to the former, either remain for an indefinite period under the same type, or run into other forms, while the corresponding affections in the latter are transitory and immutable. Thus, ordinary roseola entirely disappears in the course of a few days, while syphilitic roseola, unless arrested by treatment, often persists for months, or gives place to syphilitic papules or pustules which may continue for years.

The entire absence, or small amount of pruritus attendant upon the syphilodermata is a characteristic and highly important symp-

[1] Bassereau, op. cit., p. 81.

tom. It is surprising to observe how little inconvenience is experienced by the patient even when the eruption covers a large extent of surface; instead of suffering from a constant sensation of heat and itching, as is usual in other affections of the skin, he will disregard its presence, or even be entirely ignorant of its existence.

Some little caution is requisite, however, in receiving the statements of patients upon this point. Many persons when questioned as to the amount of pruritus will at first represent it as very considerable, while an examination of the surface will indicate, by the absence of scratches made by the finger nails, that their sensations are exaggerated, and close inquiry will satisfy the surgeon of the correctness of this conclusion. More or less irritation, however often attends syphilitic eruptions in the neighborhood of the genital organs and upon the scalp, and may be occasioned in any part of the body by an accompanying eczema of simple origin or by scabies. Still, the insensibility of the skin referred to is, in most cases, a very valuable symptom of the syphilodermata, and the presence of severe pruritus should lead the surgeon to suspect some other cause than syphilis. On two occasions, when called to treat patients supposed to be affected with a syphilitic eruption, the attendant itching has induced me to make a careful examination of the skin, and has led to the discovery of pediculi which were the sole cause of the disease.

Bassereau has called attention to the frequent coexistence of various forms of syphilitic eruptions upon the same person, as an important element of diagnosis. In other affections of the skin, we rarely, if ever, find a union of blotches, papules, vesicles, and pustules; while in the early stage of constitutional infection, owing to the rapidity with which one syphilitic eruption runs into another, all these different forms are frequently observed at the same time upon the same person. This tendency to polymorphism is not manifested by the later syphilitic eruptions.[1]

The same author has also dwelt upon the entirely distinct character of some forms of syphilitic eruptions, and upon the differences which exist between others and their congeners among the simple affections of the skin. Thus mucous patches are only occasioned by the syphilitic virus, and certain forms of papules and tubercles are exclusively dependent upon the same cause. Again, syphilitic vesicles often consist of a papular base, with a slight effusion of

[1] A fine specimen of a polymorphous syphilitic eruption, composed of blotches, vesicles, and pustules, is figured by Ricord, Iconographie, Pl. X.

serum at the summit, and syphilitic pustules of impetigo rest upon prominent and thickened portions of the integument — characters which are never present in the corresponding simple affections of the skin.

The seat of an eruption will sometimes indicate its origin. Thus simple acne is confined to the face, trunk, and upper extremities, while syphilitic acne frequently involves the thighs and legs. Again, ecthyma of the hairy scalp is almost invariably produced by the syphilitic poison.

The coexistence of undoubted syphilitic symptoms will afford a strong probability that an eruption is of specific origin; although it should not be forgotten that constitutional infection is no bar against the outbreak of simple affections of the skin.

The history of the case must be taken into the account, and the symptoms of the preceding ulcer and its complications are especially worthy of attention as a means of determining whether the sore was a chancroid or chancre. The length of time since the supposed contagion, taken in connection with the elementary lesion of the eruption, is also of value; thus a roseola cannot be due to a chancre contracted eight or ten years, nor tubercles to one contracted two months ago.

Finally, the influence of treatment may aid in establishing the diagnosis, since in cases in which the history of the patient is imperfect and the symptoms obscure, a cautious trial of mercury and iodine will often enable us to determine, by the effect produced, whether a cutaneous eruption be due to syphilis or to other causes. It should not be forgotten, however, that all syphilitic patients do not improve under the administration of specific remedies, so that the effect of treatment cannot be regarded as infallible.

I shall follow the classification adopted by Cazenave, and describe syphilitic eruptions under the following heads:—

1. The exanthematous.
2. The papular.
3. The squamous.
4. The vesicular.
5. The bullous.
6. The pustular.
7. The tubercular.

In describing these eruptions, I shall have frequent occasion to refer to the work of M. Bassereau, which is one of the most recent, and probably the most thorough, that has appeared on this subject.

I propose also to indicate in foot-notes the plates of Ricord's admirable representations of venereal disease in which the various eruptions are figured, in order that they may readily be referred to by the student who has access to the work.

SYPHILITIC ERYTHEMA (*Syphilitic Roseola*).—Syphilitic erythema is the earliest and most frequent of all the syphilodermata. This eruption consists of irregular spots of a rose or pale red color which disappears on pressure, upon a level with the surrounding surface, and either isolated, or variously grouped together, so as to form crescents, circles, etc.[1] Sometimes the blotches are of a brighter red which is only partially effaced by pressure, are slightly prominent, and studded with minute elevations, due to distention of the cutaneous follicles. This eruption is generally slow and insidious in its development, appears by preference upon the abdomen, thorax, axillæ, and the superior portions of both the upper and lower extremities, and is so free from febrile excitement, heat, and pruritus, that the patient may not discover its presence unless by accident.

In some cases, however, when hastened by alcoholic stimulants, a hot bath, or prolonged exercise, it makes its appearance suddenly, is attended by general disturbance of the system, and may cover the whole surface of the integument including the face, which, under other circumstances, usually escapes. I have known of two or three instances in which a hot bath taken a short time before going to a party has brought out a syphilitic roseola upon the face and neck which was first detected by the man's associates in the ball-room.

The hands are in most cases unaffected, but may also be involved, and in a few instances the only traces of the eruption are two or three blotches upon the palms. Upon the dorsal surface the eruption assumes the same appearance as upon other parts of the body, while upon the palms the blotches are seated upon thickened portions of the integument, which are slightly prominent and sensitive upon pressure, exhibit the copper color to an unusual degree, and often become squamous.[2]

Syphilitic roseola gradually assumes a faint copper color, which in some cases, however, is absent during the whole course of the eruption; unless arrested by treatment it rarely disappears in less than six weeks and may continue for as many months; as it passes

[1] Iconographie, Pls. XV., XV. bis, ter, et quater.
[2] Iconographie, Pl. XV. ter.

off slight exfoliation of the epidermis takes place, and the blotches are succeeded by dingy discolorations of the skin, which remain for some time. Relapses often take place within a period of a few weeks or months, in consequence of the premature suspension of treatment, indulgence in alcoholic stimulants or other depressing influences, and are not unfrequently accompanied by a reappearance of the induration at the site of the chancre.

I have already quoted in another chapter[1] the statistics of M. Bassereau relative to the time of the appearance of syphilitic erythema, and will at present merely state the general conclusions upon this subject arrived at by this able and reliable observer. When no mercurial is administered for the primary sore, this eruption generally appears between the thirtieth and sixtieth day after contagion; it is not uncommon from the sixtieth to the ninetieth day; but is seldom met with as late as the fourth month, and is exceedingly rare in the fifth; beyond which time it only occurs in the form of a relapse, or in case it has been delayed by mercurials. It should be observed that we are here speaking of the earliest appearance of the eruption, which having once broken out may persist for a long time after the period mentioned.

Syphilitic roseola should be carefully distinguished from the erythematous eruptions which sometimes follow the administration of large doses of copaiba and cubebs, and which have frequently led to the erroneous supposition that gonorrhœa may occasion constitutional infection. The fact that the patient has been taking the anti-blennorrhagics should always induce caution in forming a diagnosis; and roseola dependent upon this cause may be recognized by the febrile excitement which generally attends it, by the absence of other suspicious symptoms, by its situation upon parts of the body which are not commonly affected in syphilitic erythema, and by its spontaneous disappearance soon after the suspension of the anti-blennorrhagic. Pruritus is also mentioned by most authors as a diagnostic sign, but although I have found it present in some cases of roseola from copaiba, in others it has been absent.

The most frequent concomitants of syphilitic erythema are scabs upon the hairy scalp, a crown of copper-colored papulæ upon the forehead, pustules and papules upon other parts of the body, engorgement of the cervical ganglia, rheumatic pains about the joints, alopecia, mucous patches within the mouth and in the neighborhood of the anus and genital organs, and minute yellowish scabs

[1] See p. 436.

surmounting papular elevations at the junction of the alæ nasi and cheeks, and upon the commissures of the lips (impetigo).

SYPHILITIC PAPULES (*Syphilitic Lichen*).—Like syphilitic erythema, syphilitic papules belong to the early stage of syphilis, but are less common than the former eruption, which in many cases precedes them.

They consist of small solid elevations of the superficial layers of the skin[1] and the neighborhood of the hair follicles appears to be most frequently involved, since at an early period of their development, each papule is traversed by a hair which soon falls out. They may be scattered irregularly over the surface, arranged in annular groups or closely aggregated. Their color is at first roseate or a bright red, which disappears on pressure; but they rapidly assume a yellowish red or copper color which cannot be entirely effaced.

Three forms of syphilitic papulæ may be recognized; the *lenticular*, in which the papules are somewhat broad and flat; the *conical*, the height of which exceeds their breadth, and which most closely resemble ordinary lichen; and the *miliary*, which are very small, and the summits of which, on their first appearance, are generally surmounted by a slight effusion of serum.

Papules are most common upon the abdomen, thorax, back, forehead, and the upper and lower extremities; but unless arrested by treatment they frequently extend over the whole integument; they are rare, however, upon the hairy scalp, which is generally the seat of syphilitic pustules. Their development is in most cases slow and by successive invasions, so that papules in their various stages may generally be found upon the same person at the same time. In some instances, however, they spring up suddenly and may in a few days cover the whole body; and when thus rapidly developed, their summits are often covered with a slight effusion of serum, which desiccates and forms a scale seated upon a papular base.

Syphilitic papules are frequently found upon the forehead, extending from the roots of the hair to the frontal eminences, where they constitute the most frequent variety of the *corona veneris* so-called, which, however, may be made up of other elementary lesions; and it is in this situation especially that the scales which form upon the summits of the papules fall off, and leave small, shining and copper-colored elevations which are highly characteristic of syphilis and which betray the disease to an experienced observer.

[1] See Ricord's Iconographie, Pl. XVII. bis.

Syphilitic papulæ are very persistent, and even when subjected to appropriate treatment, rarely disappear until after the lapse of one or two months. As resolution progresses, the copper color fades first into a tawny and then into a grayish hue, and copious desquamation of the epidermis sometimes takes place, attended by slight pruritus. They very rarely terminate in suppuration and ulceration, and yet not unfrequently are succeeded by depressions in the skin which are due to interstitial absorption of the tissues, and which disappear in the course of a few months.

In 30 cases of syphilitic papulæ observed by Bassereau in which no mercury had been administered, the eruption appeared between the twentieth and thirtieth day after contagion in 3; in the course of the second month, in 16; and during the third month, in 11; thus showing that this eruption belongs to a very early period of constitutional infection.

The concomitants of syphilitic papulæ are for the most part the same as those of syphilitic erythema. Iritis is sometimes observed, but less frequently than was supposed by Carmichael, who regarded it as the most common attendant upon this form of eruption.

Syphilitic papules may be confounded with syphilitic tubercles, with common lichen, and with acne indurata. Tubercles may be distinguished by the later stage of their development, their larger size, the greater depth to which they involve the tissues, and by their tendency to ulceration. Lichen is attended with considerable febrile excitement and severe pruritus, and is rapid in its course and termination. It is sometimes extremely difficult to distinguish syphilitic lichen when occupying the usual seat of acne, as the face, shoulders, or back, from the latter eruption. In such cases the presence or absence of other syphilitic symptoms must chiefly be relied upon to establish the diagnosis.

SYPHILITIC SQUAMÆ (*Syphilitic Pityriasis, Psoriasis* and *Lepra*).—Many of the syphilodermata in their later stages are attended by desquamation of the epidermis, and may assume the appearance of scaly eruptions, when they have had for their initial element erythema, papulæ, or even vesicles and tubercles; hence some authors have been disinclined to admit squamæ among the syphilodermata, and have referred those cases generally included under this head to other eruptions.

Syphilitic pityriasis, in which the scales are thin and furfuraceous, is chiefly met with upon the scalp, and sometimes upon the eye-

brows and those portions of the face which are occupied by the beard. It may succeed an eruption of erythema or papules, or form upon the cicatrices left by vesicles or pustules. Upon the head, where it is most common, the epidermic scales are thrown off in large quantities, or collect in a continuous scurf about the roots of the hair, which generally falls off to a very great extent.

Syphilitic psoriasis, in which the scales are larger and thicker than in the preceding variety, may be developed on all parts of the body. In most instances it succeeds an eruption of papules or tubercles, and sometimes of pustules; while in a few cases it would appear to be squamous from the outset. Like common psoriasis, it is divided into several varieties dependent upon the form of the patches, which in *psoriasis guttata* are small and scattered; in *psoriasis diffusa*, of larger size and more or less continuous; while in *lepra* they assume the form of circles. The integument beneath these patches is the seat of a low form of inflammation, and is of a red color, in which the copper hue is often absent. Unlike the patches of common psoriasis which are most elevated at the centre, those of the syphilitic form of the disease are centrally depressed, and are most prominent at the circumference. Slightly depressed cicatrices are left after the falling off of the scales, and are due to interstitial absorption of the tissues.

Syphilitic psoriasis of the hands and feet is a very characteristic symptom of general syphilis.[1] A red blotch or papule, and sometimes a pustule, first appears, generally near the centre of the palm of the hand, beneath which the skin is thickened, dry, and elevated; an irregular-shaped patch is formed of variable extent, from which the cuticle exfoliates and exposes a red and tender surface surrounded by a fringed border consisting of the remains of the epidermis. In some cases it commences as a complete ring of inflamed and thickened cuticle, including sound integument in the centre, and gradually enlarges by peripheral growth; and three or four successive rings may spring up within the one first formed. These patches are generally raw and tender, and are traversed by cracks and fissures, which bleed readily and sometimes give exit to a little pus. Complete extension of the fingers may be rendered difficult or even impossible.

In this as in all other affections of the skin, the history of the case and the coexistence of undoubted syphilitic symptoms are of the utmost value in establishing the diagnosis. Syphilitic psoriasis

[1] Iconographie, Pl. XXII.

generally appears in weak and anæmic subjects, in whose treatment tonics should play an important part.

SYPHILITIC VESICLES. — A vesicular eruption is the rarest of all the syphilodermata, although it is now admitted to be more frequent than was at one time supposed. It is one of the earliest syphilitic affections of the skin. Of twelve cases observed by Bassereau at the Hôpital du Midi, none occurred later than the sixth month, and the earliest one month after contagion. The parts which are most frequently affected are the back, face, and extremities. The vesicles may either be large and globular, small and acuminated, scattered irregularly over the surface, or arranged in groups. Many of them are found to be traversed by a hair, showing that the chief seat of the eruption is the hair follicles. Several varieties are admitted, most of which find their analogues in the non-specific eruptions of the skin.

In the variety which resembles varicella, the vesicles are large, either acuminated or globular, scattered over the surface, in some cases umbilicated, and each is surrounded by a copper-colored areola. Their contents remain serous for a short time only, and soon become purulent.

In the eczematous variety the vesicles are smaller, and either diffused or collected together in groups. They may continue transparent, or the contained serum may be absorbed, and the eruption terminate in fine desquamation without the formation of scabs, this being frequently the case upon the scrotum. Sometimes, as in common eczema impetiginodes, a thin, yellowish crust is formed, beneath which the integument is found to be superficially ulcerated.

The herpetic variety may consist of large, globular vesicles containing a citrine-colored fluid, and arranged in irregular groups seated upon a dark-red base, resembling the patches of herpes phlyctenodes; or the vesicles may be smaller and collected into groups which are either circular or ovoid, as in herpes circinnatus.

In a fourth variety described by Bassereau, the bases of the vesicles are hard and firm papular elevations, which remain for some time after the fluid has been absorbed or has escaped by rupture of the vesicles. They may even undergo still farther development, and assume the appearance of a papular syphilitic eruption.

These eruptions rarely retain their vesicular form for a long period, but terminate in the formation of scabs or scales, which are very persistent, and are finally succeeded by small depressed, and copper-colored cicatrices, which are not permanent. Syphilitic vesicles are

almost always accompanied by some other specific eruption, as erythema, papules, or pustules.

SYPHILITIC BULLÆ (*Syphilitic Pemphigus and Rupia*).—Two syphilitic affections of the skin are characterized at their commencement by the larger form of vesicles known under the name of bullæ, viz., pemphigus, which is chiefly met with in infants affected with hereditary syphilis, and rupia.

Pemphigus.—Pemphigus was unknown to the older writers on venereal, and has only attracted attention since the commencement of the present century. In 1834, Krauss[1] collected a large number of instances of this affection in infants, and carefully described its symptoms, but did not suspect that it was due to hereditary syphilis, as the researches of M. Dubois[2] have since rendered probable.

The bullæ of pemphigus are from half an inch to an inch or more in diameter, but are not greatly elevated above the surrounding surface, owing to the fact that the sacs are not fully distended with fluid; their outline is circular or ovoid; they rest upon a violet-colored base which extends for a short distance beyond the elevated epidermis; their contents consist of a serous, sero-purulent, or sero-sanguinolent fluid which is discharged by rupture of the sac; and the eruption generally terminates in desquamation, but sometimes in ulceration.

In most cases of syphilitic pemphigus of hereditary origin, the eruption is present at birth, is confined to the palms of the hands and the soles of the feet, and is soon followed by the death of the infant. Ricord figures a case in which it covered the whole body.[3] I have recently observed a case in private practice, in which this eruption appeared on the third or fourth day after birth, was seated upon the arms, abdomen, and thorax, and was followed during the third week by mucous patches about the buttocks and upon the internal surface of the cheeks. At the time of conception the father was under my care for secondary syphilis. The mother, so far as I can learn, has never manifested any syphilitic symptoms, although fear of exposing the father has prevented my making minute inquiry. The infant still lives (three months old), and its symptoms have disappeared under small doses of mercury with chalk.

Notwithstanding the fact that in most cases of pemphigus neo-

[1] De Pemphigo neonatorum, Bonnæ, 1834.
[2] Bulletin de l'Acad. Nationale de Méd., 1851, t. xvi.
[3] Iconographie, Pl. XLVI.

natorum a syphilitic taint has been discovered in one or both parents, yet the mere presence of this eruption cannot, in the absence of other symptoms, be regarded as conclusive proof of the existence of hereditary syphilis, since it is possible that infants at birth may be affected with pemphigus of simple origin from which the specific form of the eruption cannot be distinguished by its outward appearance.

A few cases only of syphilitic pemphigus have been observed in the adult as the result of acquired syphilis, one of which is figured by Ricord in his *Iconographie*, Pl. XXV. In this case, the seat of the eruption was upon the soles of the feet, and in another case observed by Bassereau, it was upon the palms of the hands, showing the same predilection for these regions both in adults and infants. When occurring in the former, the prognosis is not at all of the same serious import as in the latter.

Rupia.—Rupia is classified by some authors among the bullous and by others among the pustular eruptions. Strictly speaking, it is undoubtedly entitled to the position assigned it in the present work, although in many instances the initial bulla escapes observation and the eruption appears to emanate from a pustule.

Unlike the preceding eruption of this group, syphilitic rupia is only met with in adults and as a symptom of acquired syphilis. Its usual mode of development is as follows: a reddish spot first appears which is somewhat tender upon pressure, and upon which the epidermis soon becomes elevated by an effusion of bloody serum; the bulla thus formed is very transitory in its duration and has usually disappeared by the third or fourth day, by which time its contents have dried into a thin scab of a greenish yellow color, and an ulcer has formed beneath. By the gradual addition and desiccation of purulent matter this scab increases in height and in breadth, and assumes a very characteristic appearance; its base is circular or oval and enchased within the underlying ulcer; it often rises above the level of the surrounding integument in the form of a cone, the sides of which are uneven and stratified by the successive layers of its formation; its color is a mixture of brown and yellow, or is sometimes almost black; and it is surrounded by an areola of a dark red or copper hue. The ulcer beneath it is deep, and its edges abrupt and sharply cut. This eruption is said to be most frequent upon the lower extremities, although in cases of syphilitic origin I have quite as often met with it upon the upper. It may occur upon any part of the integument.[1]

[1] Iconographie, Pl. XXXII.

Syphilitic rupia is very persistent. Fresh scabs and ulcers appear in the vicinity of those first formed, so that the various stages of the eruption may frequently be observed upon the same person. During the reparative process, if the scabs be allowed to remain undisturbed, the ulcer granulates up from the bottom, and, when at last the scabs, having become dry and brittle, fall off, may have already attained a higher level than that of the surrounding surface. The succeeding cicatrix is of a sombre red or copper color, abruptly depressed, and indelible.

Syphilitic rupia is a late symptom of constitutional infection as shown by its usual concomitants, viz., affections of the bones and periosteum, syphilitic orchitis, deep tubercles of the cellular tissue, etc. It is an indication of a very low condition of the general system, and demands the most careful attention to the hygienic condition of the patient, and, in most cases, the free use of tonics.

SYPHILITIC PUSTULES (*Syphilitic Acne, Impetigo, and Ecthyma; Pustulo-Crustaceous Syphilitic Eruption*).—The earlier writers on venereal included all eruptions upon the skin under the name of pustules, and made no attempt to discriminate the different forms which they assumed. Yet an examination of their writings shows that syphilitic eruptions were much more frequently pustular during the Italian epidemic and for some years afterwards than now; and this might have been expected from the known severity of syphilis at that time, since it is especially in the graver cases of this disease that the tendency to the formation of pus is most marked.

Syphilitic pustules may appear upon any portion of the integument. A very common seat is upon the scalp, and the question, "Have you had any scabs in the hair?" is very frequently put to a patient by an experienced surgeon in the investigation of a suspected case of syphilis. Commencing upon the head, pustules often extend to the face and other parts of the integument, particularly in anæmic constitutions and in those cases in which the disease is peculiarly virulent. In some instances the lower extremities are chiefly affected. As in several other of the syphilodermata, the anatomical seat of the eruption appears to be in the hair follicles.

Syphilitic pustules may assume the form of acne, impetigo, or ecthyma, which, in respect to frequency, are in an inverse order to the one here mentioned; acne being the least and ecthyma the most frequent.

Syphilitic Acne.—In this form, the pustules are of small size, generally acuminated, seated upon a prominent base, show but little

tendency to spread, and remain stationary for several weeks before becoming covered with scabs, which are small, dry, and of a grayish or yellowish-brown color. The papule or plane surface left by the falling of the scab often takes on slight desquamation, and is of a more characteristic copper color than the preceding pustule. In some cases a superficial ulcer is formed.[1]

Unlike its analogue among the common affections of the skin, syphilitic acne is not limited to the superior parts of the body but may extend to the lower extremities, and may even be confined to the latter region; and this fact is of the first importance in establishing the diagnosis. When seated upon the face, back, or anterior portion of the thorax, the specific often bears a close resemblance to the simple eruption for which it may readily be mistaken. It is to be distinguished by the papular elevation left by the falling off of the scab, by the copper color of its later stages, and by the coexistence of other syphilitic symptoms which generally belong to the earlier period of constitutional infection, since, in most cases, syphilitic acne appears within a few months after contagion.

Syphilitic Impetigo.—The pustules of syphilitic impetigo are flat, of variable size, and either isolated or in groups; their base is either somewhat elevated and of a coppery red color, or sunken within a prominent border of the same aspect. An important feature is the color of the scabs, which are of a grayish or greenish-yellow hue.

This eruption is frequently observed upon various portions of the face, more particularly around the alæ nasi, at the commissures of the lips, and in the beard[2] and eyebrows, and is also met with upon the trunk, scrotum, and the upper and lower extremities.

Syphilitic impetigo, when situated upon the labial commissures or around the nasal orifices,[3] presents a very characteristic appearance, which is not observed in any eruption of simple origin. The integument beneath is superficially ulcerated and generally vegetates above the surrounding surface, while the summits of the granulations are covered with small yellowish scabs, and the patches tend to arrange themselves in circles or parts of circles, which are surrounded by a prominent border or copper-colored areola. At the commissures of the lips they are frequently continuous with mucous patches of the mucous membrane within the mouth. Upon other portions of the face it is sometimes difficult to distinguish syphilitic from common impetigo.

When seated upon the scalp, forehead, thorax, and extremities,

[1] Iconographie, Pl. XXVII.
[2] Iconographie, Pl. XLV.
[3] Iconographie, Pl. XLII., Fig. 4.

the pustules may be scattered or in groups, and often rest upon a hard, elevated, and dark red base; while the scabs are of a greenish yellow color, and the integument beneath is ulcerated. As a general rule these ulcerations are deeper and more extensive the longer the time which has elapsed since contagion.

The French have given the name of "pustulo-crustaceous" to a form of impetigo, which is only met with as a late symptom of general syphilis. The pustules are large and arranged in circles, and, the ulcers becoming continuous by gradual extension, circular patches are formed covered with yellowish scabs which are most prominent around the margin, and surrounded by an areola of a dull red color. The cicatrices are excavated, at first red and afterwards of a dull white color, and resemble those produced by a deep burn.

Syphilitic Ecthyma.—Syphilitic ecthyma, the most frequent of all the pustular syphilodermata, consists of an eruption of that form of pustules known by the name of "phlyzacious," a term applied by Willan to "pustules of a large size, raised on a hard circular base of a vivid red color, and succeeded by a thick, hard, dark-colored scab." Like ordinary ecthyma, it may affect all parts of the body, and especially the lower extremities; but unlike the non-specific eruption, it is very frequent upon the hairy scalp, where it may often be observed at the same time that the trunk is covered with syphilitic roseola or papules.

An eruption of ecthyma commences with the appearance of red and indurated spots upon the skin, the centre of which by the second or third day is elevated by an effusion of pus, which rapidly spreads until it covers the whole of the inflamed surface; the epidermis is soon ruptured, and the pus which escapes concretes into a broad brownish scab.[1]

The subsequent course of the eruption presents two varieties. In one, the tendency of the pustule and subjacent ulcer to increase in size and in depth is but slight, while in the other it is strongly marked; and hence two forms of ecthyma are admitted, viz., the superficial and the deep, the former of which is an early and the latter a late symptom of constitutional infection.

In the superficial variety, the scab first formed does not materially increase in breadth or in height, and its removal exposes a superficial ulceration which soon heals, leaving a shallow and permanent cicatrix which is pitted like the scar of vaccinia.

In the deep variety, the scab increasing in extent and in height

[1] Iconographie, Pl. XXVI. ter et quater.

by the constant addition of purulent matter, protrudes above the surface, is sometimes depressed at the centre, and is made up of consecutive rings; in most cases it slightly overlaps the edges of the ulcer, while in others it is set within the cavity, a portion of which may even be exposed in consequence of the scab not being sufficiently large to cover it. If the scab be removed, the ulcer is found to penetrate deeply into the tissues beneath; its edges are abrupt and its floor covered with a grayish secretion. The cicatrices which are left after the healing of the ulcers, are depressed, at first of a dark-red color and afterwards of a dull white, never entirely disappear, but are not pitted like those of the superficial variety.

In some cases the pustules of syphilitic ecthyma, although at first distinct, are collected together in groups, when they may unite and give rise to a large scabby patch, which constantly tends to extend over a still larger surface, and the outline of which exhibits the circular form so frequently seen in syphilitic eruptions. These patches, like those of impetigo, which they resemble, are known by the name of "pustulo-crustaceous."

An eruption of syphilitic pustules is often preceded by the combination of symptoms which I have described under the head of syphilitic fever. These symptoms, however, are of short duration, but the eruption itself is very persistent, and, under the best directed treatment, may last for several months.

The superficial varieties of syphilitic pustules belong to the early, and the deep to the late periods of constitutional infection. The former are more generally diffused over the integument than the latter. Bassereau lays down the rule, that a pustular eruption occupying different parts of the body, is rarely met with at a later period than six months after contagion, unless delayed by treatment, and calls attention to a remark made by Gabriel Fallopius in the sixteenth century to the effect that "when the pustules invade the whole body, and when they are developed in the hair and beard, it is a sign that the French disease has been contracted within five or six months."

On the other hand, the deep varieties of syphilitic pustules occupy, in most cases, but one or two regions, are much more destructive in their action, are only met with at a late period of general infection, and are consequently attended by symptoms belonging to a more advanced stage of the disease than the superficial varieties. For instance, syphilitic orchitis, nocturnal pains in the shafts of the bones, and exostoses rarely, if ever, accompany the superficial, but are common with the deep forms of syphilitic pustulæ.

In a previous chapter, attention was called to the fact that the degree of ulcerative action attending a chancre may be taken as indicative of the general condition of the system and of the probable character of the general symptoms which are likely to follow. A similar rule holds good in the syphilodermata. A tendency to the pustular forms of eruption indicates a degree of constitutional cachexia that will favor the evolution of tertiary syphilis in deep and important organs; the prognosis, therefore, in the syphilitic pustulæ is decidedly unfavorable. Of 42 persons observed by Bassereau who were afflicted with deep ulcerations of the fauces, suppurating tubercles of the cellular tissue and caries of the bones, 27 had previously had a pustular syphilitic eruption.

SYPHILITIC TUBERCLES.—Tubercles, like papulæ, are solid elevations of the derma, but differ from the latter in their larger size, the greater depth to which they involve the tissues, the later period of their development, and their marked tendency to ulceration. The name itself is an unfortunate one, since it is also applied to the pathological deposit of phthisis, to the gummy tumors of tertiary syphilis, and, very incorrectly as I shall hereafter show, to mucous patches or condylomata; but it is too commonly used to be laid aside, and I can only caution the student not to confound the various lesions to which the term is applied.

Tubercles are rarely, if ever, the first syphilitic manifestation upon the skin. It may be laid down as a rule to which there are probably no exceptions, that they have in all cases been preceded by some one of the more superficial syphilodermata, as erythema or papules. They are to be ranked among the late symptoms of syphilis, and may occur ten, twenty, or even forty years after contagion. The following table exhibits the time of development of syphilitic tubercles in 54 cases observed by Bassereau:—

The eruption appeared—

11 months	after	contagion	in	1 case.		18 years	after	contagion	in	1 case.
1 year	"	"	"	5 cases.		14 "	"	"	"	2 cases.
2 years	"	"	"	8 "		17 "	"	"	"	1 case.
3 "	"	"	"	5 "		18 "	"	"	"	2 cases.
4 "	"	"	"	6 "		20 "	"	"	"	5 "
5 "	"	"	"	7 "		22 "	"	"	"	1 case.
6 "	"	"	"	8 "		26 "	"	"	"	1 "
7 "	"	"	"	2 "		30 "	"	"	"	1 "
9 "	"	"	"	8 "		40 "	"	"	"	1 "
10 "	"	"	"	2 "						—
12 "	"	"	"	2 "					Total,	54 cases.

In many of these cases mercurials had been administered, and hence these dates do not indicate the normal period of development of tubercles when not delayed by treatment. This table, however, is sufficient to show that a tubercular eruption is far more tardy than the superficial syphilodermata, as erythema and papules, which are never under any circumstances observed so long after contagion as in many of the above instances.

Syphilitic tubercles may be seated upon any portion of the integument. It is rare for them, however, to be spread over the whole surface. They are commonly confined to one, two, or three regions, and if they involve a larger number, it is by slow and gradual progression. Their most frequent seat is upon the face, where they often attack the lips and alæ nasi, and may occasion their total destruction. Another common site is the lower extremities, where they often give rise to ulcers of long duration and very intractable.

Of 70 cases observed by Bassereau—

The face was involved in	26
" body " "	22
" upper extremities were involved in	16
" lower " " " "	14
" hairy scalp was involved in	5
" neck was involved in	8
" back of the hands was involved in	1

The anatomical seat of tubercles has been carefully studied by the same author who states that, in many cases, the changes upon which they depend appear to be confined to the neighborhood of the hair follicles; while, in others, the cellular conical protuberances upon the internal surface of the derma are the primary seat of the disease, the skin becoming thinned as the tubercle is developed, and finally ulcerating and giving exit to the adventitious deposit. Again, tubercles may commence as small tumors in the sub-integumentary cellular tissue, become adherent to the surface, and in this case also give rise to ulcers.

Syphilitic tubercles may be divided into two classes: 1. Those which terminate in desquamation or resolution; and, 2. Those which suppurate and form ulcers.

Tubercles belonging to the first class are hard, shot-like bodies, occupying the whole thickness of the skin, above which they project to a variable extent.[1] They are isolated or more frequently in

[1] Iconographie, Pl. XXV., Fig. 1, and Pl. XXVIII.

groups, and either flat, conical, or hemispherical. Their size varies from that of a small shot to a cherry. Their color is usually a dark red, though in a few instances, and especially in persons of a sallow complexion, it does not greatly differ from that of the normal integument. They are sometimes tense and shining, or covered with thin scales which fall off and give place to others, or surmounted by scabs which are the product of an effusion of serum beneath the epidermis without deep ulceration. When aggregated, they form groups which are generally circular, but sometimes irregular. The centre of the patch is often free, covered with thin, epidermic scales formed upon the site of tubercles, which have now disappeared, and of a darker color than the healthy skin. The prominent border may be composed of distinct tubercles, which in other cases are so approximated as to form one continuous circular elevation; and the patch constantly tends to enlarge by the subsidence of the old tubercles and the development of new ones external to the first. In some instances, instead of forming wheels, tubercles are collected into irregular masses, in which, however, a tendency to a circular form is still manifest, and, if closely approximated, the general thickening of the skin beneath may elevate the patch to a considerable distance above the surrounding surface.

These various forms are very slow in their progress and decline, and often persist for many years.

Ulceration may commence in the second class of tubercles in several ways. It may take place beneath the thin scab formed upon tubercles which have for a time been entirely dry; or it may attack the summits of others at a very early stage of their existence, or, again, it may commence in the interior of small tumors developed in the cellular tissue beneath the skin. In whichever way originating, it often progresses until it completely destroys the tubercles, of which no traces remain except an open sore covered by a thick scab.

As in the dry variety, tubercles when ulcerated may be arranged in the form of wheels or circles, inclosing a sound portion of the integument and constantly enlarging by peripheral extension;[1] or they may consist of elongated or spiral bands, or assume various shapes, as figures of eight, etc. In most cases there is only one ulcerated patch; in others, there are several; and in others still, the whole surface of one or more portions of the body is involved, as frequently occurs upon the face.

[1] Iconographie, Pl. XXIII. et XXIII. bis, Fig. 2.

The depth of the ulceration varies in different cases; when superficial, the scab is thin, and the subsequent cicatrix is quickly effaced; when deep, the scab is thick, of a greenish-yellow color, and either protuberant above the surface or sunken within the borders of the ulcer, and the scar is indelible. These ulcers sometimes become serpiginous and creep over a large extent of surface, healing in one direction while they advance in the opposite; causing but little detriment if superficial, but occasioning fearful ravages if they involve the whole thickness of the derma.[1] Serpiginous ulcers originating in tubercles are often seen in the neighborhood of the larger joints, and also upon the back, thorax, abdomen, and neck. They may generally be distinguished from serpiginous chancroids by their situation at a distance from the genital organs, by the interposition of sound portions of the integument between the ulcers, by the greater consistency of their secretion, the thickness of the scabs, and the history of the case.[2] A variety of tubercles, known as "perforating," sometimes attacks the alæ nasi, in the substance of which small tumors are formed, rapidly suppurate and burst, and give rise to an eroding ulcer which may destroy nearly the whole of the nasal organ.[3] Lupus exedens, which closely resembles this form of tubercles, commonly occurs before the age of puberty, is attended by a greater degree of engorgement of the neighboring tissues, and its ravages, after many years' duration, are limited to a small extent of surface.

Syphilitic tubercles have been mistaken for cancer, from which they differ in their softer consistency, in the absence of lancinating pains, and in the integrity of the neighboring ganglia.

The cicatrices left by this eruption, when the ulceration has been deep, are generally depressed, of a coppery-red color which subsequently gives place to a dull white, and either smooth or traversed by bands of inodular tissue. Bassereau has called attention to the numerous depressions which exist upon the general surface of the cicatrix and which mark the site of the tubercles of which the patch was originally composed. This character is not found in the scars of any eruption except those of syphilitic tubercles. In most cases, also, the cicatrices of this eruption may be recognized by their general circular outline or by the segments of circles which are apparent upon their borders.

Ulcerated syphilitic tubercles are never accompanied by the superficial syphilodermata. Their most frequent concomitants are

[1] Iconographie, Pls. XXXVI. and XXXVII.

[2] See p. 362.

[3] Iconographie, Pl. XIX.

syphilitic orchitis, affections of the periosteum and bones, and syphilitic cachexia.

ULCERS.—Cullerier, the elder, and Alibert admitted still another class of syphilitic eruptions which they called "the ulcerating," but ulcers originate either in a vesicle, pustule, or tubercle, and have, therefore, been included by more modern authors among the syphilodermata which have already passed under our notice. It is not necessary to repeat at length the characters pertaining to syphilitic ulcerations, according as they arise from one or the other of these initial lesions. I will simply recall to the mind of the reader, that when commencing with a vesicle, ulcers are superficial and are generally scattered in large numbers over a considerable extent of surface; that those from pustules, when the eruption occurs at an early period of infection, are also numerous but deeper than the former; while in a later stage, both the ulcers of pustules and of tubercles are more limited and more destructive in their action. In many cases, the coexistence of the various stages of the eruption in the same person will facilitate the diagnosis.

Ulcers of the skin may also be due to the suppuration and opening of deep tumors of the cellular tissue and to syphilitic affections of the periosteum and bones, but with care may be distinguished from those commencing in the skin itself.

TREATMENT.—Little need be added to the remarks already made upon the treatment of general syphilis with reference to the special treatment of the syphilodermata. As in other syphilitic affections, our chief remedies are mercury and iodide of potassium, and the only embarrassment likely to occur is to know when to employ the one and when the other. No great difficulty, however, need be experienced upon this score, provided the fact be borne in mind that the superficial eruptions which terminate in desquamation belong to the secondary stage of syphilis in which mercury is required, and that the deeper eruptions, attended by suppuration and ulceration, belong to the stage of transition or to the tertiary period, in both of which iodine should precede or accompany mercurials in the treatment. Indeed, supposing a case of syphilitic eruption to be placed in the hands of a practitioner totally incapable of assigning it its proper position upon a scientific chart of the syphilodermata, simple attention to the absence or presence of suppuration and ulceration might enable him in most cases to determine the proper course of treatment to be pursued; since he could readily

recognize the broad features which distinguish the non-ulcerative and the ulcerative affections of the skin; the former class including erythema, papules, squamæ, and vesicles, which are either entirely dry or are attended by a serous or thin sero-purulent secretion emanating from a superficial erosion; and the latter embracing pustules and tubercles which give rise to ulcers varying in extent and depth. Pustules may, indeed, occur at an early period of infection in debilitated subjects and exhibit a marked tendency to ulcerative action, but such cases do not well support the use of mercury, so that for all practical purposes the above distinction holds good.

Another indication for the choice of remedies may be found in the extent of surface covered by the eruption, which, in erythema, papules, vesicles, and the early forms of pustules, is much more extensively diffused than in late pustules and tubercles.

But by far the most valuable assistance is to be derived from the character of the syphilitic symptoms which almost always accompany the syphilodermata, and which have been particularly mentioned in the preceding pages in connection with each form of eruption. It is unnecessary at present to do more than recall to mind the syphilitic fever, headache, rheumatic pains, impetigo capitis, alopecia, engorgement of the cervical ganglia, and mucous patches, one or more of which usually accompany the earlier syphilodermata, and the osteocopic pains, affections of the bones and periosteum, and orchitis, which attend the later eruptions.

With regard to the external treatment of the syphilodermata, a simple warm bath two or three times a week, already recommended in the general treatment of syphilis for the purpose of favoring cutaneous secretion, will be found to exert a beneficial influence, especially upon those eruptions which are extensively diffused over the surface, and the effect may be increased by the addition of gelatine, bran, starch, or one of the alkalies; but medicated baths are, I suspect, more frequently recommended in books than employed in practice, at least in this country. Baths of corrosive sublimate containing half an ounce of the bichloride and an ounce of muriate of ammonia to each bath, have been highly praised by Trousseau[1] and others.

In most cases it is not desirable to remove the scabs which cover many of the late syphilitic eruptions, since they serve to protect the sore beneath from friction and abrasion, and accomplish this purpose better than any artificial dressing. As the ulcers heal under the

[1] Thérapeutique, 5ème éd., i., 229.

administration of internal remedies, the scabs fall off and expose a surface which is nearly, if not quite cicatrized.

In some cases, however, as in tubercular eruptions upon the face, squamæ upon the palms of the hands, and open ulcers upon various parts of the body, a regard for external appearances or the comfort of the patient requires the use of topical applications, as ointments of the red precipitate, nitrate or iodide of mercury, or iodide of sulphur; lotions containing aromatic wine, the potassio-tartrate of iron, chlorinated soda, or the compound tincture of benzoin; or the emplastrum hydrargyri, or emplastrum de Vigo cum mercurio which is in much favor with the French, especially in syphilitic eruptions upon the face. An excellent treatment of sluggish syphilitic ulcers is to sprinkle their surface with iodine in powder and cover them with dry lint and a bandage. A favorite application with Ricord, is lint soaked in the following solution of iodine.

℞. Potassii iodidi gr. xv.
Tinct. iodinii ℥iss.
Aquæ ℥vj.
M.

I have found equal parts of glycerin and the oil of cade an excellent local application to the squamous eruption upon the palms of the hands; or when there is much surrounding inflammation the following formula may be used:—

℞. Oil of cade ʒij.
Glycerin ʒv.
Solution of subacetate of lead ℥j.
M.

CHAPTER X.

SYPHILITIC AFFECTIONS OF THE APPENDAGES OF THE SKIN.

ALOPECIA.—There are two forms of alopecia dependent upon syphilis and appearing at different stages of the disease.

The first form is much more frequent than the second, and is, indeed, one of the most constant of the category of early symptoms which should ever be borne in mind by the surgeon who treats venereal diseases, in order that he may be able to recognize the first evidence of vitality in the syphilitic virus after the period of dormancy which follows the evolution of the chancre. No apology will be necessary to the professional reader if I add, that one cannot but admire the wonderful order and regularity in the development of even so loathsome a disease as syphilis, nor fail to take pride in being able to detect the presence of this destructive poison from so slight an indication as the unwonted falling of the hair, enlargement of the cervical ganglia, nocturnal headache, redness of the fauces, pustules upon the scalp or a few blotches upon the body. It is fortunate both for the physician and patient that he whose duty it is to treat the sad consequences of vice, can yet find interest and pleasure in his occupation.

The falling out of the hair is a very early symptom of general syphilis, and may take place before the appearance of any eruption upon the skin, in conjunction with those symptoms which are known under the name of syphilitic fever. It varies greatly in degree in different cases; in some it is so slight as not to attract attention unless discovered by the surgeon, who finds on passing his fingers through the hair and exerting slight traction upon it that it comes out with unusual facility; while in others the hair falls out by handfuls, especially when there is an abundant eruption of pustules or pityriasis upon the scalp. Nor is this symptom always confined to the head; in many cases it also affects the eye brows, which may become so nearly bald as to render the patient conspicuous, especially if his hair be light colored. In rare instances the eyelashes and the beard fall out in a similar manner.

This early form of alopecia is always amenable to treatment, and the patient may be assured that there is no danger of his becoming permanently bald. We cannot, indeed, arrest the falling out of the hair at once, but so soon as the system is brought under the influence of mercury, especially if conjoined with tonics, the tendency ceases, and the hair is reproduced. In those persons who have taken mercurials for their chancre, this symptom is often absent.

There is another form of alopecia which is mentioned by the earlier writers on syphilis as having been extremely common in former years, but which is now very rare. It is characterized by the disappearance of every vestige of hair from the whole integumental surface, is only met with in the later stages of syphilis, and generally in conjunction with syphilitic cachexia, and is almost always incurable.

Treatment.—The early form of alopecia is speedily arrested by the constitutional treatment of syphilis, and there is no necessity for resorting to the use of remedies especially directed to the reproduction of the hair. To meet the wishes of patients, however, it is often desirable to prescribe some local application which may not perhaps be entirely without effect in hastening the appearance of a new growth. For this purpose pomades or washes containing a stimulant, as castor oil or tincture of cantharides, are commonly employed. The following formulæ may be recommended:—

℞. Aquæ Cologuæ ℥j.
Olei ricini ℥j.
Spiriti recti ℥j.
M.

℞. Aquæ ammoniæ ℥j.
Olei ricini ℥ij.
" olivæ ℥j.
" terebinthinæ ʒij.
" bergamii,
" jasmini, āā q. s.
M.

The following is a very pleasant preparation:—

℞. Spiriti ammoniæ aromat. ℥j.
Glycerinæ ℥ss.
Tinct. cantharidis ʒiss.
Aquæ rosæ ℥vij.
M.

The following is known as Dupuytren's pomade:—

℞. Medullæ ossium bovis ℥j.
Tinct. cantharidis ℥j.

Digest to a proper consistency and add—

Plumbi acetatis ʒj.
Balsami Peruviani ℥iij.
Olei caryophylli,
" canellæ, āā ♏ xv.
M.

℞. Olei olivæ ℥ij.
Adipis ℥ij.
Hydrarg. oxidi rubri levigati ʒj.
Olei amygdalæ ℈ss.
Glycerinæ ʒj.
M.

Either of the above preparations may be used once or twice a day. Fine-toothed combs and soap of every kind should be avoided, and the scalp be cleaned, if required, with a solution of borax or with the yolk of an egg and warm water.

In the late form of alopecia the iodide of potassium should be employed internally in conjunction with mercury.

ONYCHIA.—Syphilitic onychia is a much rarer affection than the preceding, and appears at a later period of constitutional infection. In the cases I have met it has coincided with a pustular or squamous eruption. The nails of the fingers are much more frequently affected than those of the toes. I have at present under my charge a man of dissipated habits who contracted syphilis six months ago, and who now has condylomata about the anus and upper and inner parts of the thighs, mucous patches within the mouth and upon the prepuce, a pustular eruption in circular patches upon the scalp and breast, lepra upon the palms of the hands, and all of whose finger nails are affected with onychia, while the nails of the toes are intact.

In this affection, as most frequently observed, the integument around the base of the matrix becomes swollen, red, and tender on pressure, is detached from the nail and its epidermis exfoliates. The nail itself loses its vitality, becomes thickened, opaque, roughened, dry, and very friable, and is often deviated from its normal direction. In a more advanced stage of the disease, ulceration of the matrix takes place, and pus may be made to exude by pressure upon the elevated border; sometimes fungous granulations spring up as in ingrowth of the nail,[1] and in extreme cases the whole matrix is destroyed, the nail falls off and is not reproduced.

Treatment.—Except under the circumstances just mentioned, syphilitic onychia yields to mercury and the nail resumes its normal

[1] See RICORD's Iconographie, Pl. XLII., Fig. 8.

characters. Under the administration of specific remedies it is interesting to watch the new and tender growth springing up from the matrix and pushing before it the remnants of the old nail deformed by disease. Lotions of corrosive sublimate and ointments of the red oxide and other preparations of mercury are recommended, but I have never found it necessary to resort to other than general treatment. Diday recommends that the patient should wear upon the affected finger a cot the extremity of which is filled with emplastrum de Vigo cum mercurio rubbed up with a sufficient quantity of olive oil to give it a semi-liquid consistency.[1]

WHITLOW.—Syphilitic panaris may be here considered for the sake of convenience, although it is not properly included among the syphilitic affections of the appendages of the skin. Its symptoms do not materially differ from those of the common affection known under the name of whitlow or felon, for which it is usually mistaken; but it more frequently leaves the finger in a state of chronic inflammation and engorgement and gives rise to fistulæ which are extremely difficult to heal if the cause of the disease be not recognized. Such mistakes are the more liable to occur because this may be the only existing symptom of syphilitic infection, or its only concomitant a gummy tumor at a distance and concealed by the patient from the surgeon. Like ordinary whitlow, it arises either in the periosteum, sheaths of the tendons or cellular tissue covering the phalanges. It is usually observed in the tertiary period of the disease, and is to be treated by iodide of potassium. An interesting case of this affection has recently occurred at Nélaton's clinique.[2]

[1] Gaz. Méd. de Lyon, No. 2, 1860.
[2] Gaz. des Hôp., March 8, 1860.

CHAPTER XI.

MUCOUS PATCHES.

"THE name 'mucous patch' is applied to a lesion peculiar to syphilis, consisting of elevations of a more or less decided rose color, frequently rounded in form, the surface resembling a mucous membrane, and situated in the neighborhood of the outlet of mucous canals, especially around the genital organs and anus, upon the mucous membrane of the mouth, and sometimes upon other parts of the body, more particularly at the base of the nails and wherever the reflection of the integument upon itself forms natural folds in the skin."[1]

This affection is one of the earliest and most frequent secondary manifestations of syphilis, and is therefore one with which the student of venereal should be perfectly familiar; unfortunately obstacles have been placed in the way of acquiring a knowledge of it by the confusion which has been introduced in its classification, and in the terms which have been applied to it. Different authors, according to the views they have entertained of its nature, have described it among tubercles, pustules and papules, and have called it by the corresponding names of "mucous tubercle," "pustule" or "papule." But the first two of these terms are entirely inappropriate, since it does not resemble syphilitic pustules or tubercles in its time of development, its symptoms, course, or termination. The name mucous papules is less objectionable, since this lesion consists in most instances of a development of the papillæ forming broad elevations above the surrounding surface; but it is not always elevated, and may even be excavated, and it is moreover so distinct in its characters from ordinary papules, and of such importance as a symptom of constitutional infection, as to entitle it to the separate name adopted by MM. Deville and Davasse, which I shall here retain.

[1] DAVASSE and DEVILLE, Des Plaques Muqueuses, Arch. Gén. de Méd., 1845, t. ix. et x.

As stated in the definition given by the authors just mentioned, the seat of this lesion includes the outlet of mucous canals, and those portions of the external integument which are maintained by contact in a constant state of warmth and moisture, and are thus very nearly in the condition of mucous surfaces. Some idea of its comparative frequency in these various regions may be obtained from the following tables: —

In 130 men observed by Bassereau, mucous patches were found—

Around the anus	110 times.
Upon the tonsils	100 "
" " scrotum	66 "
" " lips	55 "
" " glans and prepuce	28 "
" " velum palati	27 "
" " tongue	18 "
" " pillars of the soft palate	17 "
" " internal surface of the cheeks	11 "
Between the toes	11 "
In the fold between the scrotum and thigh	5 "
At the nasal orifice	2 "
On the posterior wall of the pharynx	2 "
At the base of one of the toe nails	2 "
" " meatus urinarius	once.
In the axilla	"
Upon the gums	"
Covering the thighs in an infant three months old	"

In 186 women observed by Davasse and Deville, mucous patches were found —

Upon the vulva	174 times.
" " anus	59 "
" " perineum	40 "
" " nates and upper and inner parts of the thighs	38 "
" " tonsils	19 "
" " nostrils	8 "
" " tongue	6 "
" " toes	5 "
" " face	5 "
" " umbilicus	3 "
Around the nails	2 "
Upon the ears	2 "
" " soft palate	2 "
" " inguinal fold	2 "
" " neck	once.
" " nipple	"
" " cervix uteri	"

It thus appears that the most frequent seat of mucous patches in men is around the anus and within the mouth, and in women upon the vulva. It has been asserted that they are much more frequent in the latter than in the former sex, but the difference is probably not so great as has been supposed. There is certainly no more common symptom in male patients affected with syphilis. They are also present in most cases of hereditary syphilis in infants, and in consequence of the moist condition of the integument at this early age, are not confined to the regions above mentioned but may be scattered over the whole surface of the body and especially the nates and thighs.

The development of mucous patches is everywhere favored by inattention to cleanliness, and in the mouth by the use of tobacco, either by smoking or chewing; in men who are habituated to this practice, they constitute one of the most persistent and troublesome symptoms we have to deal with, and in dirty prostitutes of the lower class they are equally abundant and obstinate about the genital organs. At Bellevue Hospital, in this city, I have seen some remarkable instances of mucous patches upon the walls of the vagina and cervix uteri, the consequence of syphilis and filthy habits.

Mucous patches vary in appearance according to their situation. The chief points of difference are found between those seated upon the external integument and those upon membranes which are strictly mucous.

The former, which are met with for the most part around the anus and genital organs in the two sexes, consist of rounded disks, either single or aggregated, of a reddish or grayish color, granulated and elevated to the height of about a line above the integument upon which they appear to be superimposed. Their appearance is so peculiar, that when once seen it cannot be forgotten. Let the student who has never had the opportunity to observe them consult the admirable representation in Ricord's *Iconographie*, Pl. XVII.

Their mode of development is as follows: A red spot first appears upon the skin, and a slight effusion takes place beneath the epidermis — sufficient to loosen it from the derma but not to raise it in the form of a vesicle or bulla; the epidermis is removed by friction or falls off, and exposes a raw surface upon which a moist, grayish pellicle is soon formed; the surface is elevated by hypertrophy of the superficial layers of the skin and gives rise to the broad, flat, wart-like disks above referred to.

Another and a very singular mode of origin of mucous patches is from the surface of a chancre, which, during the reparative process, may granulate above the surrounding integument, and become covered with a thin, translucent and grayish pellicle. This remarkable transformation of a primary into a secondary symptom has already been described in the chapter upon chancre. Numerous instances of its occurrence upon the genital organs are recorded, and I have myself met with several. Bassereau relates an interesting case in which it took place upon the lower lip.[1]

When originating in the manner last mentioned, mucous patches are seated upon an indurated base, but otherwise the tissues beneath them are found on pressure to retain their normal suppleness. Contrary to the statements of some authors, they never present the copper color of other syphilitic eruptions, but are either of a reddish or grayish white color. If the patient happen to be jaundiced, the pellicle covering them may be tinged with yellow. They are usually smeared with a very offensive muciform secretion, which is peculiarly unpleasant when the patches are seated in the neighborhood of the genitals, and I have repeatedly known the odor to be so strong as to pervade the room. In a few exceptional instances the patches are dry.

Mucous patches readily become ulcerated. When exposed to friction against the clothes or the opposed integument, the pellicle covering the patch is removed, and a red, superficial, but depressed ulceration takes the place of the elevated disk. Such is the origin of the raw surfaces frequently seen upon the sides and front of the scrotum in syphilitic patients.

Ulcerated mucous patches upon the margin of the anus closely resemble ordinary anal fissures, from which they may be distinguished by their more prominent and rounded edges, and by the grayish pellicle which is generally visible upon the sides of the cleft. When situated between the toes, they yield a thin, brownish, and very offensive discharge, and they often project upon the dorsum or palmar surface of the foot in the form of a crescent at the base of the interdigital sulci. Ulcerated and fissured mucous patches upon the margin of the anus, between the toes, or elsewhere, are called *rhagades*.

Condylomata upon the vulva are generally elevated and of a reddish color, as is well represented in Ricord's *Iconographie*, Pl. XX. Those that I have seen within the vagina and upon the cervix uteri,

[1] Op. cit., p. 326.

have more closely resembled mucous patches upon the external integument than those situated upon other mucous membranes, as, for instance, within the buccal cavity. Mucous patches upon the genital organs in both sexes sometimes give rise to a discharge resembling gonorrhœa from the neighboring mucous membrane, which is not unfrequently observed about the time that early secondary symptoms appear, or when a relapse of general symptoms takes place.

Unlike most syphilitic eruptions mucous patches are frequently attended by severe pruritus, especially when seated upon the scrotum or perineum, and when proper attention is not paid to cleanliness or the parts have become warm and moist from exercise or prolonged contact in bed. The unquestionably contagious character of these lesions has been dwelt upon in another chapter.[1]

Mucous patches within the buccal cavity present a somewhat different appearance from those now described. Their most characteristic feature is the grayish-white color, appearing as if they had been pencilled over with a crayon of nitrate of silver, which has given them the name of "opaline patches." They are more irregular in their outline than condylomata, and unlike the latter are not, as a general rule, perceptibly elevated above the surface. In some cases, the adventitious deposit which gives them their grayish color and which is with difficulty removed, is confined to the irregular margin of the patch, while the centre remains sound; and when presenting this appearance they have been compared to the track of a snail.[2]

The most frequent seat of this form of mucous patches is upon the internal surface of the lips and cheeks, upon the sides and dorsum of the tongue, upon the gums, tonsils, and soft palate. They rarely extend beyond the pillars of the fauces, although occasionally, as in two instances in Bassereau's table already quoted, they are seen upon the walls of the pharynx. Since the invention of the laryngoscope they have also been seen upon the epiglottis and mucous membrane of the larynx.

A frequent situation is at the angle of the mouth, where they are often intersected by cracks and fissures, the sides of which present the characteristic grayish color of this lesion, and where they are continuous with small patches of impetigo upon the external integument. Upon the dorsum of the tongue, their base is sometimes hard, indurated, and fissured; or the pellicle which at first covers

[1] See page 456.

[2] Inconographie, Pl. XX., bis.

them may be rubbed off by the food, leaving a slightly depressed surface resembling an aphthous ulceration; or, again, they may granulate above the surface and form vegetations. When seated upon the tonsils, mucous patches are peculiarly exposed to irritation and ulceration from friction of the food in deglutition, and ulcers are formed, attended by considerable inflammation and swelling of the surrounding parts, and in which the characters of the original lesion are entirely lost. Deglutition is very much impeded, and the surrounding inflammation may extend to the Eustachian tube and produce partial deafness.

Bassereau states that mucous patches may react upon the neighboring lymphatic ganglia, in the same manner as syphilitic eruptions situated upon the scalp, but only in case their development is attended by acute inflammation. Thus the submaxillary glands are frequently swollen from sympathy with mucous patches upon the fauces; and the inguinal glands may be enlarged in consequence of the presence of condylomata upon the scrotum, but the effect upon the latter is less readily perceived because they are generally indurated from their anatomical connection with the primary sore. In two cases observed by Bassereau, in which the chancre was situated at a distance from the genital organs, the inguinal glands were enlarged in consequence of mucous patches in the last mentioned situation. This effect upon the ganglia is, however, exceptional, and always consists of mere engorgement and never of induration.

The following tables from the same author exhibit the period of development of this lesion after contagion when no treatment had been instituted, and also when mercury had been given for the primary sore:—

In the former case, mucous patches appeared—

On the 20th day after contagion in	1 instance.
" 29th " " "	1 "
From 1 to 2 months after contagion in	25 instances
" 2 " 3 " " "	5 "
" 3 " 4 " " "	7 "
" 4 " 5 " " "	5 "
" 5 " 6 " " "	3 "

In the latter case—

From 2 " 3 months after contagion in	2 instances
" 3 " 4 " " "	6 "
" 4 " 5 " " "	5 "
" 5 " 6 " " "	5 "
" 6 " 7 " " "	6 "
" 7 " 8 " " "	2 "
" 8 " 12 " " "	5 "
" 12 " 18 " " "	3 "

I will again remind the reader that these dates have reference to the first development of the eruption only. The difference in the two tables shows the power possessed by mercury to delay the appearance of secondary symptoms.

Mucous patches are exceedingly chronic and persistent, and are very prone to reappear; they are, indeed, the most frequent evidence of the renewed activity of the syphilitic poison.

TREATMENT.—In addition to the general treatment by mercury which mucous patches require in consequence of the indication they afford of the existence of syphilitic intoxication, certain local applications are advisable. In the case of condylomata, Ricord's favorite treatment, which consists in washing them twice a day with Labarraque's solution of chlorinated soda, then sprinkling them with calomel and separating the opposed surfaces by the interposition of lint, is generally very successful, but it is sometimes necessary to destroy them with nitrate of silver, nitric acid, or the acid nitrate of mercury.

Mr. Victor de Meric speaks highly of an ointment employed by several physicians of the German Hospital, London, consisting of two drachms of calomel, the same quantity of sulphate or oxide of zinc (it matters not which), and one ounce of lard. After a few applications, the excrescences become dry and horny, fall off and leave a raw surface which soon heals. When there is much inflammation present, the application of poultices should precede this treatment.[1]

Mucous patches in the mouth should be touched with nitrate of silver or one of the stronger caustics, and various gargles may be employed which will be mentioned in a subsequent chapter. This local treatment should by no means be neglected, since without it these lesions will often persist in spite of the use of remedies directed to the cause of the disease.

[1] Lettsomian Lectures, p. 42.

CHAPTER XII.

GUMMY TUMORS.

FROM the fact that gummy tumors are among the latest symptoms of syphilis, they are described in most works on venereal in one of the closing chapters. I prefer to consider them thus early because they afford me an opportunity of speaking of a peculiar product of syphilis, a knowledge of which is essential to the proper understanding of the subsequent pages. Nor is this course inconsistent with the general plan of this work, in which it has not been my purpose to treat of syphilitic affections exclusively in their chronological order, but in whatever connection I could hope to place them in the clearest light before the reader; and this object, I think, will be best accomplished by a description founded upon the seat of the disease, and embracing tertiary lesions—in which the gummata play so important a part—at the same time with secondary. This has already been done in the chapter upon syphilitic affections of the skin, in which both the early and late syphilodermata have been included; and the same topographical plan will be pursued in the remainder of the work.

The term "gummata," or gummy tumors, is applied to one of the later manifestations of syphilis which usually appears at least several years and never within a period of six months after contagion, and consists of small tumors which are developed in the cellular tissue underlying the skin and mucous membranes, and which slowly progress to suppuration and ulceration. These tumors are the type of a class which includes others developed in the muscles, tendons, viscera, testicles, etc., but, when the name is used without a qualifying epithet, those of the cellular tissue are alone intended, although we also speak of "gummy tumors of the muscles," "of the tendons," "of the heart," "of the testicles" (syphilitic orchitis), etc.; all of which depend upon a deposit of the same material in the normal tissue of the organ.

Gummy tumors of the cellular tissue commence as hard lumps, freely movable upon the subjacent tissues and beneath the skin,

which is not altered in appearance. They are at first unattended by pain or inflammation, and occupy a long period, as, for instance, several months or a year, in attaining their full development. Sooner or later, however, they become somewhat tender on pressure, of a softer consistency, and adherent to the integument; suppuration commences at the centre and never in the surrounding cellular tissue; the skin covering them assumes a dark red or livid color, is thinned, ulcerates and gives exit to a small quantity of ichorous pus. The dissolution of the adventitious deposit which commenced at the centre of the tumor, advances towards the superficies, and gives rise to a deep and extensive ulceration overhung by an irregular border of skin which is thinned and undermined. The reparative process does not begin until the external layers which formed a kind of cyst about the tumor, have been cast off by suppuration; and the subsequent cicatrix, depressed, at first of a violet and afterwards of a dull white color, has the appearance as if produced by a deep burn.

Gummy tumors are rarely multiple; but a number often appear in succession for a long period. They may occur upon all the external parts of the body, but are most frequent upon the extremities, neck, and head. Their size varies from a small nut to a hen's egg. I have recently been treating one upon the arm just above the elbow-joint, which gave rise to an ulcer three-fourths of an inch in depth and from an inch and a half to two inches in diameter. When seated in the neighborhood of the bones, as upon the scalp or walls of the pharynx or palate, they may give rise to caries and necrosis. Gummy tumors are not unfrequently developed in the cellular tissue beneath the dartos of the scrotum, where they have been mistaken for syphilitic orchitis, and have led to the mistaken notion that suppuration, which is really a very rare termination of the latter affection, is of common occurrence.[1] Ricord has given a fine illustration of gummy tumors in this situation. (*Iconographie*, Pl. XXXVIII.).

I shall repeatedly have occasion to speak of gummy tumors in the remaining chapters of this work in connection with syphilitic affections of different regions; as, for instance, the sloughing ulcers of the fauces, syphilitic tubercles of the tongue, tumors of the muscles, tendons, etc.

The microscopical appearances of gummy tumors are thus described by Lebert: "A thin section of the tumor is found to consist of loose fibrous tissue, made up of pale elastic fibres, inclosing

[1] Mr. Hamilton, of Dublin, in his Essay on Syphilis (quoted by Langston Parker p. 219) has evidently committed this error.

in their large interspaces a homogeneous, granular substance, the elements of which are less adherent to each other than in deposits of true tubercle. These granulated cells or corpuscles do not exceed in size O^{m}, 005; they are rounded and contain an irregularly granulated substance; and some of the larger corpuscles attain the size of O^{m}, 0075, have pale and irregular walls, and appear to contain a rounded nucleus."[1]

Robin says that "these tumors are made up of rounded nuclei belonging to fibro-plastic cells, or *cytoblastions;* of a finely granular, semi-transparent and amorphous substance; and finally, of isolated fibres of cellular tissue, a small number of elastic fibres, and a few capillary bloodvessels."

The anatomical elements of syphilitic tubercle are not peculiar to this disease, for they are found in the healthy tissues and also in tumors which have no connection with syphilis. This deposit, however, is remarkable from the extent to which it is found in syphilitic lesions. It has been detected in the bones and periosteum; in syphilitic tumors of the nerves, muscles, and tendons; in the liver, heart, brain, lungs, and testicles; its deposit in the submucous tissue precedes the sloughing ulcers of the pharynx and larynx; it forms the tubercles which are observed in the skin, tongue, etc.; and Virchow asserts that it is present even in the indurated base of chancres. The extent to which this deposit may be found has but recently attracted attention, and sufficient time has not yet elapsed to determine its exact limits. Virchow's attempt to found a classification of syphilitic lesions into "passive and active," based upon the absence or presence of this deposit, must, I think, to say the least, be regarded as premature.[2]

The treatment of gummy tumors of the cellular tissue is almost wholly included in the internal administration of iodide of potassium, which certainly has a much greater power than mercury in effecting the cure of the local disease; although mercurials are generally required to prevent a relapse or the occurrence of other forms of syphilitic manifestations.

Both Ricord and Vidal recommend what would appear to be a very questionable mode of practice, viz., the extirpation of the tumor with the knife before suppuration has taken place or the surrounding parts have become inflamed. These tumors should be opened as soon as fluctuation can be detected; and the subsequent ulcers, if inclined to spread, should be treated like other sores which assume a phagedenic character.

[1] Note to M. Van Oordt, Des Tumeurs Gommeuses, Thèse de Paris, 1859, p. 16.

[2] See p. 401.

CHAPTER XIII.

SYPHILITIC AFFECTIONS OF MUCOUS MEMBRANES.

ATTEMPTS have been made by several authors, and especially by Babington,[1] Ricord,[1] and Baumès,[2] to establish a classification of syphilitic eruptions upon mucous membranes founded upon their initial lesion, as is the case with the syphilodermata. There is no doubt that the manifestations of syphilis upon these two regions exhibit a general correspondence, which, indeed, in the case of erythema and tubercles is almost perfect, and which may be traced between the superficial erosions of vesicles, the deep ulcers of the late form of ecthyma, and the eroding ulcers of tubercles upon the skin on the one hand, and the aphthæ and excavated ulcerations of the mouth and fauces on the other. But the attempt to carry this analogy still farther has led to presumptions which, I think, are somewhat fanciful, as in the supposed identity of the grayish pellicle of mucous patches with the squamæ of scaly eruptions upon the skin; and it must in general be confessed that although points of resemblance are often apparent between syphilitic eruptions upon cutaneous and mucous surfaces (which are indeed but one continuous membrane), yet that the physical conditions in which the latter are placed—their constant moisture, exposure to friction, etc.—prevent as accurate a classification as we are able to establish in the former. In what I have to say of syphilitic eruptions upon mucous membranes, I shall take every occasion to point out any analogy which may exist between them and the syphilodermata, but shall avoid any attempt at a classification founded upon the supposed initial lesion, hoping thereby to avoid unnecessary subdivisions and to place the subject in a clearer light before the reader.

ERYTHEMA.—Erythema of the mucous membranes is identical, in the time of its appearance and in its general characters, with the same eruption upon the skin. Like the latter, it appears between

[1] Notes to Hunter on Venereal, p. 429 and 447.

[2] Traité des Maladies Vénériennes, ii., p. 443.

six and eight weeks after contagion, when mercury has not been administered, and may probably affect any of the outlets of mucous canals, although it is most frequently seen upon the fauces, pituitary membrane, and genital organs, and in many instances doubtless fails to attract attention. Upon the fauces it presents an appearance of redness and congestion, either generally diffused over the surface or circumscribed in patches, is often attended by more or less œdema, and frequently terminates in the formation of mucous patches.

I have in several instances observed erythema of the mucous membrane covering the glans penis and lining the prepuce, independently of any eruption upon the external integument. In a case recently under my care, in which I was watching for the appearance of general symptoms after the cicatrization of an ulcer upon the penis of doubtful character, redness of the membrane lining the furrow at the base of the glans led to further examination, when I found a pustule upon the scalp and engorgement of two cervical ganglia, although there was no eruption upon the body. Ricord has described and figured[1] a case of erythema of the glans penis coexisting with roseola upon the trunk, in which the former eruption was arranged in circles of a bright-red color, inclosing sound portions of the mucous membrane, and closely resembling the roseola upon the body.

Ulcers.—Ulcerations of mucous membranes may be divided into three varieties, viz.: 1. Superficial erosions; 2. Ulcers of limited extent and depth, commencing upon the surface and penetrating the whole thickness of the mucous membrane; and, 3. Phagedenic ulcers, which commonly originate in tubercles or gummy tumors of the submucous cellular tissue, and which are exceedingly destructive in their character. It will be observed that in the first two varieties ulceration commences from without, and in the last from within the mucous membrane.

1. The superficial form is a mere erosion or aphtha, which does not penetrate beneath the epithelium, and which arises in the following manner: The mucous membrane becomes congested in the part which is to be occupied by the ulcer, and a slight effusion of serum takes place beneath the epidermis, which is soon completely detached and exposes a superficial erosion, presenting a smooth and somewhat polished surface which is sometimes covered with a slight exudation at the centre but which does not assume the grayish pellicle peculiar to mucous patches.

[1] Iconographie, Pl. XV.

Syphilitic aphthæ may appear upon the genital organs in both sexes, and also within the buccal and nasal cavities and upon the fauces. They are frequently seen of variable extent upon the sides and dorsum of the tongue, which, in the part affected, is deprived of its papillary layer, and presents a smooth polished surface in striking contrast with the furry coat around it. Ricord has given a good representation of syphilitic aphthæ upon the side of the tongue in his *Iconographie*, Pl. XX. bis, Fig. 4.

2. The second variety is an excavated ulcer, involving the whole thickness of the mucous membrane; its edges are abrupt and sharply cut; its floor covered with a diphtheritic exudation of a dull grayish color, and its secretion purulent. These characters are nearly identical with those of the chancroid, and the ulcer in question has sometimes been called an amygdaline or secondary chancre. The chancroid, however, is rarely, if ever, met with in the buccal cavity, and may always be recognized by its susceptibility of inoculation upon the person bearing it. Experimental inoculation cannot be employed to distinguish between a secondary ulcer and a chancre, neither of which is auto-inoculable.

The ulcer now under consideration is the analogue of the deep form of ecthyma, and belongs to a later stage of syphilis than the superficial erosion last described. It is almost always sluggish in its course, and, especially in cachectic subjects, exhibits a decided tendency to spread. Its most frequent seat is upon the tonsils, which may be entirely destroyed by the progress of the ulcer. The neighboring parts are more or less red and swollen, and deglutition is attended with difficulty and pain. This affection should be carefully distinguished from tertiary ulcerations of the throat, as may almost always be done if regard be paid to the time which has elapsed since contagion, the appearances of the parts affected and the concomitant symptoms, whether belonging to the secondary or tertiary stage of syphilis.

3. The third variety of ulcerations of the mucous membranes is commonly due to the suppuration of syphilitic tubercle deposited in the submucous tissue.[1] The commencement of the attack may

[1] Dr. Wilks, in speaking of these ulcers in the larynx, says: "In the larynx, the term ulceration has been employed; but this is secondary to the deposition of an adventitious material in the submucous tissue, and by which indeed this form of disease is, I think, recognizable; the walls of the tube are much thickened and indurated, apart from the ulceration which may be present on the mucous membrane: and in some cases the whole disease may consist in a mass of hard tissue, like a node or tumor, occupying the glottis and obstructing the passage." (*Pathological Anatomy*, p. 463.)

readily pass unnoticed, especially as mercurial treatment of the primary sore may have entirely prevented the appearance of secondary symptoms, and many years of uninterrupted health have led the patient to entertain hopes of security for the future.

When involving, as it frequently does, the neighborhood of the fauces, the earliest symptoms consist of slight pain in deglutition and indistinctness of speech; and if the throat be examined at this time, more or less swelling and redness are discovered confined to some one portion of the surface; in most cases, however, the patient does not seek advice until suppuration has taken place and produced an ulcer. The sore thus formed is surrounded by an irregular border, is covered with a pseudo-membranous secretion of a yellowish-gray color, and constantly extends by a process of phagedenic ulceration, which is not limited even by the osseous tissues.

The tubercular deposit may have taken place in the cellular or muscular tissues intervening between the two mucous layers of the soft palate, in which case the ulcer opens a communication between the mouth and posterior nares and eats away the uvula; or, again, the disease may originate in the walls of the pharynx, and, unless arrested by treatment, destroy the pillars of the fauces and tonsils, advance upwards to the posterior nares and involve the Eustachian tube and middle ear, or downwards and encroach upon the base of the tongue, œsophagus, epiglottis, and larynx. The breath is rendered intolerably fetid, speech and deglutition are seriously interfered with, and a portion of the food is regurgitated through the nares. Deafness may be induced in consequence of the ulceration involving the Eustachian tube, or the œdema surrounding the ulcer closing its orifice; or the osseous tissues may be attacked, giving rise to caries and necrosis of the cervical vertebræ, hard palate, or maxillary bones. The general condition of the patient, which in most cases was enfeebled at the outset of the disease, becomes reduced to a very low ebb; emaciation and hectic fever may set in and death ensue. In those cases which terminate favorably, the edges of the ulcer subside, its surface cleans off, healthy granulations spring up, and the ulceration finally heals leaving a white, indurated and tendinous cicatrix to mark its site.[1]

Dr. Wilks says of the post-mortem appearances of syphilitic ulcerations of the mucous membranes: "When a syphilitic ulceration

[1] Representations of tertiary ulcerations of the throat may be found in Ricord's Iconographie, Pls. XXXIV. and XXXVII.

is examined after death, it may generally, I think, be told, for the reason I named when speaking of the larynx, by the adventitious fibrous deposit or lymph which is formed in the tissue, and thus, besides the ulceration, you find the adjacent parts much thickened and indurated."[1]

Tubercles of the Tongue.—Syphilitic tubercles may also appear beneath the mucous membrane or in the substance of the tongue, and give rise to phagedenic ulcers occasioning the partial or almost total destruction of this organ. M. Lagneau has recently published an interesting essay on this affection, based upon an analysis of five cases observed by Ricord and Bouisson, and five others not previously reported.[2] It appears from this author's researches that syphilitic tumors of the tongue do not occur except at a late period of syphilis; but that they are not necessarily accompanied by general cachexia as asserted by some authors, since many patients appear to be in a state of perfect health. In some cases they affect the superficial and in others the deeper portions of the tongue, or, again, all the lingual muscles may be involved; at the commencement of the disease the base of the tongue is most frequently attacked. The superficial forms correspond to tubercles of the integument and cellular tissue; the deeper to the gummy tumors which are observed in the muscles and tendons of various parts of the body.

Syphilitic tubercles of the tongue are sometimes isolated and at other times multiple; their size varies from a buckshot to a small nut; they are generally globular but sometimes irregular in shape; at first of a grayish but after suppuration has taken place of a yellow color; at their commencement they are almost as hard as cartilage, but they gradually soften into a pasty consistency and finally open and give rise to ulcers varying in depth, oblong in form and surrounded by irregular and abrupt margins.[3]

The floor of the ulcers is of a grayish color, rarely covered by a diphtheritic secretion, and sometimes presents small patches of gangrene; the base is at first indurated, but gradually becomes soft; the ulcer readily bleeds from contact with the teeth. The union of several ulcers may occasion the destruction of a considerable portion of the tongue, which remains very much deformed after cicatrization has taken place.

In many cases these tumors can only be recognized at their com-

[1] Lectures on Pathological Anatomy, London, 1859, p. 258.
[2] Gaz. Hebdomadaire, 1859, Nos. 32, 33, 35.
[3] Iconographie, Pl. XXXV., Figs. 1 and 2.

mencement by grasping the tongue between the fingers, to which the organ imparts a sensation as if filled with small nuts. At a later stage, it becomes swollen either partially or wholly, and hence is liable to be bitten by the teeth, and in some cases protrudes from the mouth. There is frequently a constant and copious flow of saliva, and sometimes difficulty and pain in swallowing, speaking, and even breathing. The submaxillary ganglia are very rarely affected, and this is a very important diagnostic sign between syphilitic tubercles and cancer of the tongue. Moreover, in the former affection there are usually several masses of induration occupying by preference the dorsum and base of the tongue; while in the latter there is only one which is most frequently seated upon the side of the organ. The absence or presence of lancinating pain and the effect of treatment will also aid in establishing the diagnosis, which may in some cases be difficult, especially after ulceration has taken place.

Syphilitic tubercles may also affect the lips where they have been mistaken for epithelial cancer; but the former are generally situated at some distance from the margin, while cancer first appears upon the free border of the lips in the form of a wart or ulcer covered with a scab, and is, moreover, attended by lancinating pains.

Ricord describes a case in which he found two syphilitic tubercles of the size of a pea in the substance of the glans penis, and states that he has met with others in the neck of the uterus.[1]

TREATMENT OF SYPHILITIC AFFECTIONS OF THE MOUTH AND THROAT.—The treatment of syphilitic affections of the mouth and throat resolves itself into constitutional and local. For an account of the former I must refer the reader to the chapter upon the treatment of general syphilis. Suffice it at present to say, that mucous patches, erythema, and the superficial forms of ulcers belong to the secondary stage of syphilis and require the use of mercurials in accordance with the directions given in the chapter referred to. Tubercles and sloughing ulcers, on the other hand, should be treated exclusively with iodide of potassium, a nourishing diet and tonics, at least until the local affection is relieved, and the general health, if previously impaired, is raised to the normal standard, when mercurials may be employed still farther to aid in eradicating the disease. The value of the potassio-tartrate of iron in large doses in all cases of sloughing ulcers should not be forgotten. The moist

[1] Iconographie; remarks upon the case figured in Pl. XXXIV.

mercurial vapor bath, so administered that the fumes may be inhaled, is deserving of high commendation in syphilitic affections of the fauces.

In consequence of the great inconvenience, suffering, and even danger attending many of these affections of the mouth and throat, local treatment is of paramount importance. The cicatrization of mucous patches, and superficial ulcerations, whether situated upon the lips, internal surface of the cheeks, tongue, or fauces, should be promoted by the application of the solid crayon of nitrate of silver. When this is not successful, and in nearly all cases of the ash-colored, excavated ulcers upon the tonsils or uvula, the stronger caustics, as nitric acid or the acid nitrate of mercury, must be employed. In making these latter applications, great caution is required, lest the acid come in contact with the sound tissues, or its fumes be inhaled; and these evils may be avoided by taking care that the probang or glass rod which is employed be not so wet as to permit the fluid to drop from it, and by allowing the fumes to pass off before the remedy is applied.

The application of caustics should, however, be deferred in cases attended by severe inflammation and swelling of the fauces, which must first be subdued by saline cathartics, rest, mustard pediluvia, low diet, and sometimes by leeches at the angle of the jaw. I have found the most grateful topical application under these circumstances to be a solution of tannin in glycerin (ʒj to the ℥j, with the addition of extract of opium if the pain be severe), which may be applied with a camel's-hair brush two or three times a day. Rest should be promoted by means of sedatives, of which Dover's powder is the best.

So soon as the acute inflammation has subsided, various astringent and tonic gargles may be employed with benefit. One of the best that I am familiar with is the undiluted tincture of cimicifuga. It should be prepared from the fresh root, as otherwise the effect is much diminished. Washes and gargles containing Labarraque's solution, chlorate of potash, the bichloride of mercury, or the oxymel of the subacetate of copper also serve an excellent purpose.

℞. Liquor. sodæ chlorinatæ ʒij–ʒiv.
Mellis ℥j.
Aquæ ℥v.
M.

℞. Potassæ chlorat. ʒj.
Infusi lini Oj.
M.

℞. Hydrarg. bichloridi gr. vj.
Acidi hydrochlorici gtt. xij.
Syrupi ℥j.
Aquæ ℥viij.
M.

℞. Oxymellis cupri subacetatis ℥ij.
Aquæ ℥vj.
M. (Langston Parker.)

Either of the above washes may be used three or four times in the twenty-four hours. In fetid and phagedenic ulcerations of the throat, the following is a valuable formula:—

℞. Creasoti ♏x.
Mellis ℥j.
Aquæ ℥vij.
M.

In all syphilitic affections of the mouth and throat, the surgeon must insist upon the patient's abstaining from the use of tobacco, which is found in practice to be the most common cause of the persistency of these lesions and of their frequent return after removal.

Tubercles beneath the mucous membrane of the soft palate or pharyngeal walls should be laid open with the knife as soon as suppuration can be detected, and if the resulting ulcers assume a sloughing character they should be touched with the stronger caustics. The compound tincture of iodine diluted with water (a drachm to six ounces) is a favorite gargle with Ricord after acute inflammation has subsided.

Syphilitic Stricture of the Œsophagus.—In an able paper by Mr. James F. West, Surgeon to the Queen's Hos ham, which was published in the *Dublin Quarter Medical Science*, for Feb., 1860, the probability, if no certainty, that stricture of the œsophagus may be d was first established.

The case upon which Mr. West's observations were was one of a girl aged 21, who had suffered for seve well-marked syphilitic manifestations, such as erupt skin, ash-colored ulcerations of the fauces, rheuma syphilitic cachexia, and who was admitted into Que May 18, 1858, for stricture of the œsophagus. Treatn of tonics, iodide of potassium, and mercurials afforde rary relief, and she succumbed on Sept. 2, of the sar following appearances were found at the post-mortem "The upper portion of the œsophagus for about four inches was much dilated; its mucous membrane thickened, and marked by spots having the appearance of recent cicatrices. At this distance from the upper end it was suddenly constricted, and terminated in a narrow canal which would barely admit a No. 4 catheter. This constricted portion, which was about two inches and a half in length was formed by the thickening of the mucous membrane, and by

fibrous deposit in the form of bands and bridles, having very much the appearance of an old stricture of the urethra. Below this track the œsophagus continued perfectly healthy to its termination in the stomach. Both lungs contained tubercular deposit in different degrees of softening, with several small cavities in the upper lobe of each, one in the left apex being as large as a pigeon's egg."

In reviewing this case Mr. West remarks: "We have no account of the swallowing of any caustic or irritating fluid, so that we cannot attribute the stricture to that cause. The presence of numerous recent cicatrices clearly indicated that ulcerations had existed in the walls of the œsophagus. The deposit in the submucous tissue was fibrous; it was exactly similar in nature to that which is so well described by Dr. Wilks[1] as characteristic of syphilitic ulceration, and could not under any supposition be referred either to cancerous or tubercular degeneration."

Mr. West[2] has since reported another case in which the pathological appearances were very similar, and states that Mr. Langston Parker has recently met with a case of general syphilis in private practice in which unmistakable stricture of the œsophagus existed.

In reviewing this subject it appears extremely probable that Mr. West is right in his conjecture as to the cause of the stricture in the cases which have come under his observation, since we may readily admit that syphilitic ulceration of the fauces may extend to the œsophagus or attack the latter as a primary affection; and yet it is singular that this effect of syphilis has attracted so little attention from previous observers, and to the names of those authors who are quoted by Mr. West as silent upon the subject, I will add that of Yvaren, whose work on the *Métamorphoses de la Syphilis* includes nearly all the obscure forms of syphilitic disease, so far as they are known. Follin,[3] however, was of the opinion that some of the reported cases of stricture of the œsophagus might be attributed to syphilis, and Virchow has met with contraction of the upper portion of this tube in the post-mortem examination of a syphilitic subject.[4]

In the first case reported by Mr. West, iodide of potassium and mercurial fumigations were used without benefit, while in the second case the former remedy is said to have given temporary relief. It is probable, however, that the stricture is due to contraction of the

[1] Quoted upon p. 564 of the present work.
[2] Dublin Quart. Journal of Med. Sci.
[3] Des Rétrécissements de l'Œsophage, Paris, 1853, p. 80
[4] Syphilis Constitutionnelle, p. 88.

cicatrix, and not to the ulcer itself, and hence that it is not amenable to specific remedies and can only be palliated by mechanical dilatation.

SYPHILITIC AFFECTIONS OF THE STOMACH AND INTESTINES.—Functional disturbance of the digestive organs is not an uncommon effect of the contamination of the blood by the syphilitic virus, as shown by the loss of appetite or the occasional inordinate desire for food, and the nausea and vomiting, which sometimes accompany the appearance of early secondary manifestations.[1] The general cachexia belonging to the later stage of syphilis may also be attended by intestinal derangement. The evidence is much less conclusive that syphilis ever gives rise to organic changes in the stomach and intestines, similar to those that are met with in the mouth, rectum, and other outlets of mucous passages.

Yvaren was able to collect but four cases in which there was any appearance of direct connection as cause and effect between syphilis and diseases of the parts in question.

The first was a case of dysentery reported by Boyle,[2] the details of which are too imperfect to justify a conclusion as to its nature, but which was probably simple ulceration of the rectum.

The second, reported by Baumés,[3] was a case of gastralgia, hepatalgia, and hypochondria, of eight years' duration. The only antecedent syphilitic symptoms were a chancre and non-suppurating bubo, which were treated by mercurials. The patient was sent to some mineral spring, when a syphilitic serpiginous eruption appeared and the intestinal symptoms ceased.

The third case, reported by Andral,[4] was one of a woman, aged 29, who had daily attacks of vomiting which prevented her retaining food upon the stomach, and tenderness over the epigastrium, but without any evidence of the existence of a tumor or disease of the liver. These symptoms were uncontrollable by the usual remedies employed in such cases, and organic disease of the stomach was suspected; but the appearance of a syphilitic ulcer upon the fauces led to the administration of mercurials, under which she obtained complete relief. Her antecedents had been of a suspicious character.

In the fourth case reported by the same author,[5] symptoms of chronic gastritis and phthisis pulmonaris disappeared under the use of mercurial inunction in a person undoubtedly affected with syphilis.

[1] See p. 510. [2] SAUVAGES, Médicine Méthod., viii., p. 180.
[3] Précis des Maladies Vénériennes, t. i., p. 372.
Clinique Médicale, t. iv., p. 122. [5] Op. cit., t. iv., p. 122.

Cullerier[1] has also endeavored, with very questionable success, to establish the existence of tertiary enteritis, dependent upon gummata of the submucous cellular tissue of the intestines, in infants affected with hereditary syphilis; and he believes that this is the cause of the larger proportion of deaths in infants born of syphilitic parents. Again, Pillon[2] has reported a supposed case of secondary enteritis in an adult coinciding with an eruption of roseola upon the integument.

None of these cases, however, can be regarded as entirely conclusive, although they are sufficient to induce the practitioner, when ordinary remedies fail to afford relief in obstinate affections of the intestinal canal occurring in syphilitic subjects, to make a cautious trial of mercurials.

Syphilitic Affections of the Nasal Passages.—In the order of frequency of syphilitic manifestations, the nasal passages probably come next to the buccal cavity, although the former are less exposed than the latter to observation, and, in many instances, their lesions consequently pass unnoticed. The pituitary membrane may be the seat of erythema, mucous patches and superficial ulcerations, which obstruct the nasal passages and give rise to a muco-purulent secretion and other symptoms resembling those of an ordinary catarrh, from which they differ in their greater persistency, and in their disappearance upon the administration of mercurials. Sometimes an ulcer can be seen just within the nasal orifice, surrounded by a swollen condition of the mucous membrane, and rendering the alæ nasi tender upon pressure; and plugs of inspissated mucus, mixed with blood and pus, are from time to time discharged from the deeper recesses of the organ.

In a more advanced stage of the syphilitic diathesis, ulcers of a deeper description appear, which originate in tubercles developed beneath the mucous membrane and gradually involve the cartilaginous and osseous textures; or the latter structures may be first attacked and the pituitary membrane become implicated secondarily. Dryness and obstruction of the nasal passages are the first symptoms complained of by the patient, but suppuration soon takes place, giving rise to an exceedingly fetid discharge of bloody pus and mucus, hard and dark-colored scabs, and fragments of necrosed

[1] L'Union Médicale, 1854, No. 137. Virchow says that the affection described by Cullerier is only simple ulceration of the intestinal follicles. (*Syphilis Constitutionnelle*, p. 162.)

[2] Gaz. des Hôp., 1857, No. 66.

bone; the voice assumes a nasal sound; the sense of smell may be lost; the patient breathes chiefly if not entirely through the habitually open mouth; the disease is exceedingly persistent, and finally leaves the nose flattened, or its bridge sunken from the partial destruction of its osseous and cartilaginous support. The remaining portions of the ossa nasi become thickened and eburnated, and are often separated superiorly so as to form a longitudinal furrow running along the dorsum of the nose. According to Virchow,[1] this tendency to eburnation and thickening of the osseous tissue is not confined to the part first affected, but may extend to the bones composing the base of the skull.

The earlier syphilitic affections of the nasal passages readily yield to the internal administration of mercurials, and rarely require topical applications. In tertiary affections of the same organ, iodide of potassium, preparations of iron, the mineral acids, cod-liver oil, and other tonics must frequently be employed either alternately or in combination, and for a long period, in order to afford permanent relief to the disgusting and distressing symptoms. The most efficacious local treatment consists in mercurial fumigations, which may be administered by means of the ordinary mercurial vapor bath, provided the general health of the patient be not too much reduced; but a more convenient method is to evaporate a sufficient quantity of calomel, the bisulphuret or binoxide of mercury from a metallic plate heated over a spirit lamp, directing the fumes into the nostrils by means of a tunnel of paper or other convenient material. Injections of black wash, diluted chlorinated soda (one part to twelve or twenty of water), and weak solutions of nitrate of silver or chloride of zinc, by means of the syringe represented upon page 113, will also be of much service. I most frequently employ a saturated solution of chlorate of potash.

SYPHILITIC AFFECTIONS OF THE LARYNX AND TRACHEA.—The effects of syphilis upon the air-passages are chiefly confined to a late period of syphilis, and consist in ulceration of the mucous membrane and suppurative inflammation of the cartilages.

Syphilitic Aphonia.—Diday has described a singular affection of the larynx, independent of any appreciable lesion and accompanying early secondary manifestations, to which he has given the name of *syphilitic aphonia.* Its symptoms are of such a peculiar character, that it is not commonly noticed except in public singers, since the

[1] La Syphilis Constitutionnelle, p. 64.

pronunciation is clear and distinct so long as a conversational tone is maintained, but as soon as the patient attempts to sound the higher notes of the musical scale, his voice fails him and he can scarcely emit an audible sound. This diminution in the compass and flexibility of the voice is the only indication of the disease. There are no symptoms of coryza, angina, or bronchitis, no cough, dyspnœa, pain, or difficulty in swallowing, nor general febrile excitement. Diday states that he has met with twenty cases of this affection, all of which occurred at an early period after the development of the chancre; and in five, of which he possesses accurate notes, the average interval was four months.

Diday's paper on this subject was written before the laryngoscope had come into general use, and he was at a loss to account for the pathology of this affection. He was unwilling to ascribe the symptoms to mucous patches of the larynx, because at that time these secondary lesions had not been observed deeper than the pharynx. Since then, however, Gerhardt and Roth[1] are said to have found mucous patches in the larynx in eight out of forty-three cases of early secondary syphilis, which they examined with the laryngoscope; and it is highly probable that this will explain the aphonia described by Diday.

Syphilitic aphonia generally begins to improve on the second or third day after commencing mercurial treatment, and disappears in the course of a week.[2]

Syphilitic laryngitis, unlike the affection just mentioned, is always a late symptom of syphilis, occurring many months and generally many years after contagion. It is, in most cases, accompanied by tertiary manifestations, and even when isolated has always been preceded by other symptoms, and frequently by sloughing ulcers of the fauces.

This disease may consist in an ulceration of the mucous membrane, or in inflammation of the perichondrium surrounding the laryngeal cartilages. In the former case, it may have extended from an ulcer of the pharynx, or have originated in the larynx; and it often involves the internal surface of the epiglottis, and the greater portion of the lining membrane of the laryngeal cavity. According to Virchow[3] it is always accompanied by inflammation of the neighboring perichondrium. The latter affection, however,

[1] Archiv für Pathologisch Anatomie, 2 series, vol. I, first part; quoted in the Gaz. Hebdom., Aug. 9, 1861.

[2] Gaz. Méd. de Lyon, No. 2, 1860.

[3] La Syphilis Constitutionnelle, p. 149.

may exist alone without ulceration of the mucous membrane, and an abscess form within the perichondrium denuding and destroying the cartilage, as is observed between the periosteum and bone in syphilitic periostitis. The greater portion of the cartilage may become necrosed and separated in the form of a sequestrum, as in the case figured by Ricord.[1] The mucous membrane, even when not ulcerated, is usually more or less œdematous. The existence of an abscess or inflammatory deposit without the laryngeal cavity explains the enlargement of the throat which is sometimes visible externally, and the prominence of which is increased by the emaciation of the patient.

At the commencement of the disease, the voice is husky, and respiration difficult; slight pain is felt in the region of the larynx; and the patient hawks up a small quantity of purulent matter mixed with blood, and sometimes containing small sloughs; at a later stage, the voice is entirely lost or can be heard only in a whisper; the larynx may be seen on external examination to be increased in size; the patient becomes very much emaciated, and death may ensue from exhaustion or asphyxia. These symptoms do not materially differ from those of laryngeal phthisis, and the differential diagnosis may in some cases be attended with difficulty. The latter disease, however, is always accompanied by a deposit of tubercles in the lungs, and auscultation will therefore enable us to decide as to the nature of the affection, even when this is not evident from the history of the case and the concomitant symptoms.

The post-mortem appearances of syphilitic disease of the larynx and air-passages are thus described by Dr. Wilks: "In the tuberculous disease of these organs, apart from the small amount of adventitious scrofulous deposit, the affection is characterized by the extensive ulceration, whereas, in the syphilitic form the peculiarity is the thickening and induration owing to a formation of fibrous tissue. The difficulty is in distinguishing between a syphilitic and a simple inflammatory form of disease; but I believe the majority of cases of *chronic laryngitis* which we meet with are syphilitic, and the more likely is this to be the case when there is a large amount of fibrous deposit present. The disposition in constitutional syphilis is to the production of lymph, which may subsequently become a tough fibrous tissue; this you see in periosteal nodes, as well as in the same formations in other parts; and thus in the larynx you may find sometimes, perhaps, nothing more than a mass of fibrous tissue

[1] Iconographie, Pl. XXX.

developed in the glottis, and almost closing it; in other cases you find, with this extreme thickening, also the epiglottis thickened and hardened; or this condition may extend down the larynx as far as the trachea; or the whole organ may be indurated throughout, and even sometimes the cellular tissue externally with the adjacent small lymphatic glands all matted together, and implicated in the process. With this induration there is generally more or less destruction of the parts, and in most cases, no doubt, the ulcerative process has accompanied the induration and contraction: and thus the inner surface has either lost its mucous membrane, or presents a cicatriform appearance. Sometimes, if the ulceration is considerable, the whole of the inner surface of the larynx presents a shaggy or flocculent aspect, and occasionally the ulceration is continuous over the glottis, with an ulcer of the pharynx; in such a case the question may arise as to the original site of the disease; but, as both these parts may be independently affected, it is possible that the disease in both has progressed simultaneously. Other parts of the air-passages may be affected as well as the larynx, as you see in the specimen I now show you, where the lower part of the *trachea* is very much thickened, and the surface ulcerated; and in the preparation I just now showed you, of contracted *bronchus* arising from an ulcer, the nature of the disease was clear, in the fact of the patient dying of syphilitic laryngitis: the contracted trachea also had the same origin. As I before mentioned, in some of these cases of the ulceration of the trachea the rings are laid bare, as you will see in these specimens; and which sometimes become detached during life, if the patient recovers."[1]

Syphilitic ulceration of the *trachea*, which is described by Dr. Wilks from preparations in Guy's Hospital Museum, has been noticed in a number of reported cases, in some of which the affection was confined to the trachea and in others implicated also the larynx. Thus Virchow[2] cites the case of Marguerite Rudloff, who died of stricture of the larynx following syphilitic ulceration, and in whom cicatrices were found in the trachea and bronchia with stricture of the latter.

It is an interesting fact that stricture of the air-passages consequent upon the *cicatrization* of a syphilitic ulcer may cause death from dyspnœa, so that specific remedies may in reality hasten a fatal termination just so far as they exert a beneficial influence upon the local disease. Two interesting cases of this description are given in the *Annuaire de la Syphilis* (année 1858, p. 324).

[1] Pathological Anatomy, p. 204.

[2] La Syphilis Constitutionnelle, p. 151.

In the first, reported by Moissenet, the stricture was situated just above the bifurcation of the trachea. The lining membrane at this point presented a honeycomb appearance, and the cartilages were more or less changed in their structure and destroyed; indeed, four of the rings had entirely disappeared and were replaced by flexible tissue; hence, in addition to the diminution in the calibre of the tube, its walls collapsed at each act of inspiration and added to the difficulty in the ingress of the air. The patient had been taking mercurials and iodide of potassium which only aggravated her symptoms. Tracheotomy was performed without benefit, since the larynx was unaffected and the obstruction was below the artificial opening. Death was caused by asphyxia.

The following is a summary of the second case reported by M. Demarquay:—

The patient, aged 36, entered a *maison de santé*, Oct. 25, 1858, with all the symptoms of œdema of the glottis. He seemed to be threatened with suffocation; his respiration was noisy and painful; he had had a cough for two months with slight expectoration; his sputa resembled those of laryngeal phthisis; and he had lost much flesh. For a fortnight his symptoms had been very intense. The lungs were found to be sound; and as the patient had had ulcers upon the penis twelve years before, followed six years afterwards by ulceration and perforation of the soft palate, iodide of potassium was ordered. Under this treatment he continued to improve for a month; but on Nov. 25th he was suddenly seized with such extreme dyspnœa that M. Demarquay thought it best to perform tracheotomy. The operation was of no benefit and death soon ensued.

At the autopsy, the larynx was found to be perfectly healthy, with the exception of a small cicatrix between the two arytenoid cartilages; but the trachea was found to be abruptly contracted opposite its eleventh ring, at which point its circumference measured only 28 millimètres. This stricture involved the left side of the trachea and was formed of cicatricial tissue in which six rings of the tube were twisted on themselves and fractured. Below the stricture the bronchia were dilated, and their longitudinal muscular fibres hypertrophied. The lungs were healthy, and free from tubercles.[1]

The *bronchia* may also be the seat of syphilitic ulceration and consequent stricture.

In the case of Marguerite Rudloff, reported by Virchow, "the right bronchus was contracted at its bifurcation and above that point; a section of it presented the form of a triangle; its diameter measured

[1] Bulletin de la Soc. Anat. de Paris, 2e série, t. ii., p. 484.

a quarter of an inch, while that of the left bronchus measured half an inch. The left bronchus was contracted to a still greater extent near its bifurcation, but only for the distance of a quarter of an inch, and was adherent at this point to the normal œsophagus through the intervention of a thick and tendinous mass of tissue. The right bronchus was the seat of thickening and contraction which extended for a short distance into its branches, which farther on were reddened upon their internal surface and dilated. Several larger dilatations of the bronchia were found in the inferior lobe of the lung which was otherwise healthy; and at these points the pulmonary tubes were filled with mucus and surrounded by condensed tissue which extended as far as the pleura."

Virchow concludes from this and another case of which he gives an analysis, that "we must admit the existence of syphilitic ulceration and stricture of the bronchia similar to the same lesions of the larynx, and must also concede that syphilitic bronchitis may give rise to chronic pneumonia, in the same manner as laryngeal ulcerations cause extensive induration of the cellular tissue of the neck. I have often seen in constitutional syphilis, limited star-shaped cicatrices of the pleura and the sequela of pleurisy, in consequence of the above mentioned changes."[1]

Treatment.—The prognosis in syphilitic ulcerations of the air-passages is exceedingly unfavorable. The iodide of potassium, mercurials, nourishing diet and tonics may, in some cases, afford relief, while in others they prove inefficacious, or, in a few instances, as already remarked, may hasten a fatal termination by inducing cicatrization of the ulcer and consequent contraction and stricture. Carmichael believed that the ulcerative process was maintained by the transit of the air, and that the best method of cure was the early performance of tracheotomy. These views have not, however, been confirmed by recent surgeons, who resort to this operation only in cases of impending suffocation, and even then, since the stricture may be seated below the artificial opening, if for no other reason, the prospect of affording relief is very dubious.

[1] Op. cit., p. 154.

CHAPTER XIV.

SYPHILITIC AFFECTIONS OF THE EYES.

A LARGE number of tissues enter into the composition of the orbit and its contents, and syphilitic affections of this region are correspondingly numerous; but a minute description of all of them would be inconsistent with the limits of this work; and I shall therefore merely allude to several of them and dwell chiefly upon those which are the most common and most likely to fall under the care of the general practitioner.

AFFECTIONS OF THE BONES OF THE ORBIT.—Syphilitic nodes may be met with upon either of the four walls of the orbit. They are most frequent near the anterior opening of the socket, but may occur at a greater or less depth within its cavity and cause protrusion of the eyeball and loss of vision consequent upon stretching of the optic nerve. The following cases are reported by Mr. Poland:—[1]

CASE 1. John M——, æt. 41, a large, bony, well-developed man, became an out-patient at Moorfields, suffering from an extensive swelling of the bone at the upper part of the orbit, encroaching upon the eyeball so as to displace it downwards and forwards. The history of the case, as well as the present marks of old mischief, at once indicated the nature of the growth.

From his statement, it appeared that about ten years ago he had undeniable syphilitic inoculation; hardened chancre and a non-suppurating bubo, followed by secondary symptoms of a rather protracted form. He underwent mercurial treatment, both internally and by ointment, and with benefit; ultimately he became free from all symptoms, and since that time at intervals he has had occasional attacks of rheumatism, which have been relieved by iodide of potassium, and on more than one occasion he has had nodes on the tibia, which were relieved by blisters. The present swelling on the frontal

[1] On protrusion of the Eyeball, Ophthalmic Hospital Reports, vol. ii., p. 223.

bone had been in existence for nearly six weeks, and, within the last few days, had increased most rapidly in size; it was perfectly firm and hard, but very tender and painful, and seemed to extend towards the orbit, instead of taking the usual course over the forehead, and had already encroached upon the eyeball, slightly displacing it downwards and forwards. There were no cerebral symptoms whatever.

The man was ordered to take three grains of the iodide of potassium three times a day, and to rub an ointment of the same on the swelling morning and night. By persevering with this treatment for three months the swelling entirely disappeared.

CASE 2. The second case was that of a woman nearly six feet in height, and of immense bony development, who came under Mr. Poland's care at Moorfields, having a large node growing from the inner wall of the orbit; it was perfectly solid to the touch, but pushed the eye outwards and forwards, and had caused tension of the optic nerve, so that there was loss of sight, dilated fixed pupil, and perfect immobility of the eye. She soon afterwards had severe cerebral symptoms, and died suddenly in a comatose condition. There was no examination of the body.

I have never met with exophthalmos dependent upon this cause during seven years' connection with the N. Y. Eye Infirmary.

The bones of the orbit, and most frequently the frontal bone, may be the seat of caries, originating in syphilis and occasioning abscess and sinuses of the lids.

AFFECTIONS OF THE LACHRYMAL PASSAGES.—Syphilis not unfrequently gives rise to changes in the lachrymal passages, causing obstruction to the flow of tears, epiphora and lachrymal abscess and fistula. Since these passages are not exposed to direct observation, the exact nature of the changes in their walls is not always apparent. In a few instances, the disease appears to be confined to the mucous membrane and submucous tissue, and to consist in catarrhal inflammation, consequent œdema, and ulceration; in the majority of cases, however, it commences in the bony wall or periosteum, and the mucous membrane is affected secondarily; changes which correspond to those met with in other mucous membranes contiguous to bony tissue. The character of the coexistent syphilitic symptoms may afford some idea of the changes in the tear passages, which, however, can only be accurately determined by direct exploration.

The symptoms are sufficiently obvious. The tears meeting with obstruction to their transit through the lachrymal passages, collect

upon the conjunctival surface; if profuse, they flow over upon the cheek, especially when the patient is exposed to the wind, and the eye is evidently more moist than its fellow, whence the name "watery eye" applied to this disease. Soon, pressure over the lachrymal sac causes a reflux into the eye of the lachrymal secretion mixed with more or less purulent matter, or the same result takes place spontaneously; the conjunctiva, especially that of the lower lid and inferior portion of the globe, is maintained in a constant state of irritation and inflammation, and the puncta are abnormally red, swollen, and prominent. In extreme cases an abscess forms in the lachrymal sac or neighboring cellular tissue, opens and gives rise to one or more fistulæ.

Much may be done for the relief and permanent removal of obstructions of the lachrymal passages by the persevering and long continued use of specific remedies. The bichloride of mercury and iodide of potassium were for many years exclusively employed with very satisfactory results at the New York Eye Infirmary where this affection is very common. Many cases, however, refuse to yield to internal remedies alone, and in all a cure may be expedited by a resort to the improved local treatment for which ophthalmic surgery is so largely indebted to Mr. Bowman of the Moorfields Ophthalmic Hospital.[1]

Mr. Bowman's treatment consists in slitting up the canaliculi as far as the caruncle, and afterwards dilating the passage into the nose by means of graduated probes as we would a stricture of the urethra. The first part of the above procedure is often sufficient to afford great relief to the patient by opening a free communication between the conjunctiva and sac, and by preventing collections of matter in the latter or facilitating their evacuation. One or both canaliculi having been slit up, an opportunity is afforded to explore the nasal passages with a full-sized probe (about one-twentieth of an inch in diameter), and to ascertain the nature of the obstruction. If this be due to swelling of the mucous and submucous tissues alone, the passage of a probe repeated every two or three days for a few weeks, and retained on each occasion for about half an hour, will in most cases suffice to re-establish the patency of the canal; but when denuded bone can be felt, showing that the disease is seated in the periosteal or osseous tissues, Mr. Bowman's method

[1] See Mr. Bowman's papers in the Medical and Chirurgical Transactions, 1851, and in the Ophthalmic Hospital Reports, for Oct. 1857; also Remarks on Diseases of the Lachrymal Passages by the author in the Report of the N. Y. Eye Infirmary, N. Y. Journal of Med., July, 1859.

will rarely prove successful, and it becomes necessary either to resort to obliteration of the sac and canaliculi (which should always be included) by the actual cautery, or to wait for the slow elimination of the necrosed portions of bone under the internal administration of iodide of potassium. The old-fashioned style is rapidly going into disuse and has already been entirely abandoned at the Moorfields and New York Eye Infirmary. The danger and inconvenience attending its employment far more than counterbalance any benefit that can be derived from it.

SYPHILITIC AFFECTIONS OF THE EYELIDS.—These may be primary or secondary. All venereal ulcers, from direct contagion, that have been observed upon the eyelids have been syphilitic. The induration of the base of the sore is well marked and persistent, and the accompanying indurated bubo is seated in the ganglion in front of the ear. A case of this kind occurring at the New York Eye Infirmary has been referred to in the chapter upon chancre.

The external surface of the lids, like other portions of the integument, may be the seat of the various syphilitic eruptions. Secondary ulcers are almost always situated near the free border, encroaching upon the mucous membrane or upon the skin, and sometimes, as in a number of cases collected by Mackenzie,[1] causing complete destruction of the lid. I have seen but one case in a lad aged 19, affected with syphilitic disease of the lachrymal passages and nodes upon the tibia, and who had several small excavated ulcers upon the mucous membrane of the lower lid bordering upon its free margin. His disease could be traced to a chancre contracted three years previous, and disappeared under iodide of potassium and mercurials. These ulcerations may be mistaken for ophthalmia tarsi, and epithelial cancer, or, when situated near the inner canthus, for disease of the lachrymal passages.

Syphilitic eruptions of the eyelids are more frequent in infants affected with hereditary syphilis, than in adults. The external surface of the lids is the seat of an eruption of pustules, which run into each other, break and leave the skin excoriated and red.[2] The conjunctiva of the lid and the globe may become involved through extension of the inflammation, and the cornea destroyed by infiltration of pus. This affection may be distinguished from ophthalmia neonatorum by its later development—the latter appearing about

[1] Diseases of the Eye, Phil. ed., 1855, p. 160.

[2] Figured by Devergie, Clinique de la Maladie Syphilitique, Pl. 37.

the third day and the former several weeks after birth—and by the presence of the eruption upon the external surface of the lids to which the conjunctivitis is only secondary.

AFFECTIONS OF THE CONJUNCTIVA.—If we except the ulcerations of the margins of the lids already described as sometimes encroaching upon the mucous membrane of the internal surface, the conjunctiva is very rarely the seat of syphilitic manifestations.

Infants tainted with hereditary syphilis are, indeed, more frequently than others the subjects of ophthalmia neonatorum, to which they are peculiarly exposed from their general cachetic condition and the frequency of vaginal discharges in their syphilitic mothers; but there is no direct connection between their hereditary taint and the purulent inflammation of the conjunctiva, which usually makes its appearance before the development of other symptoms.

Mucous patches, so common upon other mucous membranes, are never met with upon the conjunctiva; this membrane, however, according to Desmarres,[1] is sometimes the seat of syphilitic tubercles coexisting with a similar eruption upon the skin. This author relates the case of a patient affected with syphilitic iritis, in whom one of the so-called condylomata of the iris, situated near its external margin, penetrated the sclerotic and formed a protuberance beneath the conjunctiva, which, moreover, was studded on every side with small, indolent, hard and oblong tumors, exactly similar to an eruption of syphilitic tubercles upon various portions of the integument. The disease disappeared under mercurial treatment.

Mr. Smee[2] and Mr. France[3] have met with "blotches" upon the conjunctiva, coinciding with syphilitic eruptions upon the integument and disappearing under mercurial treatment. The appearances, as described by Mr. France, are as follows: "This form of disease presents itself as a limited and well-defined discoloration of the mucous membrane of the globe, which, within the affected area is slightly thickened and raised, but not conspicuously, if at all, more vascular than the neighboring surface. There does not seem to be any disposition to ulceration, as when the margin of the lid is attacked with syphilis; there is no pain and no morbid discharge." Mr. France met with two cases, of which he gives a plate, Mr. Smee with only one.

[1] Traité des Maladies des Yeux, t. ii., p. 216.
[2] London Medical Gaz., 1844, pp. 347–8.
[3] Guy's Hosp. Repts., third series, vol. vii.

AFFECTIONS OF THE CORNEA.—Mr. Jonathan Hutchinson[1] has expressed the opinion founded upon a lengthy and ably conducted series of observations, that the peculiar inflammation of the cornea, met with for the most part between the ages of five and twenty and known by the name of "strumous corneitis,"[2] is always due to hereditary syphilis. In his attempt to establish this point Mr. Hutchinson has attached no little importance to certain peculiarities in the form, size, and color of the permanent incisor teeth, which he regards as diagnostic of inherited syphilitic taint, and which he states are all but invariably coexistent with strumous keratitis.

In describing this condition Mr. Hutchinson says: "As diagnostic of hereditary syphilis, various peculiarities are often presented by the others, especially the canines, but *the upper central incisors are*

Fig. 41.

"The teeth converge towards each other, are very short, have a vertical notch or cleft in their free edges, and are also very narrow from side to side at their edges, not being so wide there as at their necks."

the test teeth. When first cut these teeth are usually short, narrow from side to side at their edges and very thin. After awhile a crescentic portion from their edge breaks away, leaving a broad, shallow, vertical notch which is permanent for some years, but between twenty and thirty usually becomes obliterated by the premature wearing down of the tooth. The two teeth often converge,

Fig. 42.

and sometimes they stand widely apart. In certain instances in which the notching is either wholly absent or but slightly marked, there is still a peculiar color ('a dirty brownish hue resembling that of bad size'[3]), and a narrow squareness of form, which are easily recognized by the practised eye."[4] The first set of teeth do not

[1] Ophthalmic Hospital Reports, vol. i., p. 229.

[2] The name "Keratitis" is much preferable to "Corneitis."

[3] HUTCHINSON, on the Means of Recognizing the Subjects of Inherited Syphilis in Adult Life, Medical Times and Gaz., Sept. 11, 1858, p. 265.

[4] Ophthalmic Hosp. Reports, vol. ii., p. 96.

exhibit this malformation. Diday[1] adduces a single case in confirmation of Mr. Hutchinson's observations upon strumous corneitis and notching of the teeth as symptomatic of hereditary syphilis.

Since the publication of the first edition of this work I have carefully examined into the symptoms and histories of the numerous cases of interstitial keratitis coming under my care at the New York Eye Infirmary, and have in so many instances been able to confirm Mr. Hutchinson's statements relative to the deformity of the teeth, and a clearly marked syphilitic taint inherited from the parents, that I can testify to the general correctness and great value of his observations, although I am not prepared to say that interstitial keratitis is always due to congenital syphilis. In some instances I have not been able to satisfy myself that the parents had been affected with this disease, but the difficulty of such inquiry is well known, and the truth often escapes detection.

I can fully confirm Mr. Hutchinson's statement, that the most efficacious treatment of this disease, in the majority of cases, is by means of mild mercurials and iodide of potassium, assisted by a nourishing diet, fresh air, and tonics.

SYPHILITIC IRITIS.—Syphilitic iritis, endangering, as it does, the integrity of one of the most important organs of the human frame, should be familiar to every student of venereal, that he may early be able to recognize and treat it. A knowledge of its symptoms may, I think, be best imparted by a concise description, in which its prominent features, whereon the diagnosis must be based, shall be alone included, omitting the more minute details which are chiefly of interest to the ophthalmologist, and which are apt to confuse the mind of one who has not made a special study of the eye.

Let me premise by saying that we have no certain means of distinguishing syphilitic iritis from that dependent upon injury, rheumatism, or other causes; although there are certain symptoms, presently to be described, which, when observed, render the former origin probable. Moreover, the majority of cases of iritis are doubtless due to syphilitic taint,[2] so that the existence of this disease should always excite suspicion, and lead the surgeon to make a thorough examination of the present condition and past history of the patient.

[1] Gaz. Hebdom., Feb. 4, 1860.

[2] My friend, Dr. HENRY D. NOYES, of the Infirmary, informs me that, according to statistics collected and reported in his lectures by Prof. Graefe, about sixty per cent of all cases of iritis occur in persons affected with syphilis.

Two forms of iritis are admitted.

The first, which is the most common and most worthy of our attention, is to be ranked among the secondary symptoms of syphilis. Without being able to furnish any statistics from which the exact time of its development may be determined, yet I have often been struck with the fact that, when no mercury had been administered, this occurred from four to six months after contagion. In a number of instances, iritis has been the first general symptom which has induced patients to seek surgical advice, but careful inquiry has never failed to show that other symptoms, as alopecia, engorgement of the cervical ganglia, mucous patches, erythema, or papules, had preceded it, although regarded at the time as of no importance.

The most prominent symptoms of this disease are the following:—

Injection of the conjunctival and sclerotic vessels, giving the eye a red appearance. But unnatural redness is observed in simple conjunctivitis; and how shall the two be distinguished? In the first place, by depressing the lower lid, and, at the same time, telling the patient to look upwards; whereby the inferior palpebral fold will be exposed. In most cases of conjunctivitis, the greatest amount of injection will be found remote from the cornea; while in iritis the contrary is the case; the redness is almost entirely confined to a circle round the cornea, called the "sclerotic zone," while the more distant portions of the white of the eye remain clear. If the eye has been congested by the injudicious application of poultices, alum curds, etc., this difference will be less, or not at all, apparent. Again, observe the character of the injection: some of the conjunctival vessels are distended, and may be recognized by their brick-red color, large size, tortuous course (chiefly over the recti muscles), and their mobility, if the conjunctiva, by means of slight pressure with the finger external to the lid, be made to slide over the sclerotica; but beneath these brick-red vessels a second layer is discovered on close examination, composed of others radiating from the margin of the cornea, much finer than the preceding, straight, and of a pinkish hue, and which are seen to remain stationary through the meshes of the sliding network of conjunctival vessels. It is these vessels which constitute the sclerotic zone, met with not only in iritis, but in other internal inflammations of the eye.

Next observe the condition of the iris and pupil and compare them with those of the opposite and sound eye. The affected iris is seen to have lost its natural brilliancy; its minute texture is less apparent; its surface covered over with a thin layer of fibrin; and

its color changed. In persons with blue eyes it assumes a yellowish green hue; in others, the change is less marked but may generally be detected. Close the two eyes with the thumb of each hand, the fingers resting for support upon the temples, and alternately open one and then the other; and the iris of the affected eye will be found to be sluggish in its motions or quite immovable.

At a later stage of the disease one or more yellowish or brownish elevations may begin to appear upon the surface of the iris, and generally, though not always, upon its inner ring near the margin of the pupil. These "tubercles," as they are called, gradually increase in size and sometimes become organized and covered with a minute network of vessels. If seated near the external border of the iris they may cause projection of the cornea or sclerotica. Graefe states that they are composed of fibrinous exudation, granular amorphous matter and pus-corpuscles.[1] Virchow[2] believes that they are dependent upon a deposit of syphilitic tubercle in the substance of the iris, but this opinion cannot be received without further proof. They are very much more frequent in syphilitic than in iritis from other causes,[3] and their presence affords a very strong probability if not an absolute certainty of syphilitic taint.

At an early stage of the disease, the pupil assumes a dull appearance, and is less clear and bright than natural, owing to commencing changes in the anterior capsule of the lens; it may also be somewhat irregular. This irregularity of outline, due to adhesions between its margin and the capsule of the lens or to exudation into its substance, becomes more marked as the disease progresses, and is especially evident if the pupil be dilated by belladonna or atropine, when its margin is found to be scalloped owing to its being attached at some points and drawn out in others. In some cases the adhesions become continuous around the whole circumference, and the capsule of the lens is covered with a layer of lymph which completely blocks up the pupil

When syphilitic iritis is early and successfully treated, the iris resumes its normal mobility and color, and the eye is restored to its original integrity. But in weak and cachectic subjects and in the absence of appropriate treatment, the changes which take place are more or less permanent. The tubercles are absorbed but the iris never regains its original color and consistency; it is thinned and

[1] Notes of Graefe's Lectures, for which I am indebted to Dr. Henry D. Noyes.

[2] La Syphilitis Constitutionnelle, p. 146.

[3] Of sixty cases of iritic tubercles collected by Graefe, in only two was there no proof of syphilitic taint. Notes of Graefe's Lectures.

friable; and its adhesions to the capsule, unless stretched or broken by the persevering use of mydriatics, permanently impede the motions of the pupil. As a general rule, the pain and photophobia in syphilitic iritis are much less than in the other forms of the disease. The patient may merely complain of a sense of fulness and uneasiness in the globe and shrink from exposure to a strong light only. In other cases, severe pain is felt in the ball of the eye and in the temporal and supra-orbital regions, and the least ray of light causes the most intense suffering; the variations between these two extremes are numerous. There is almost invariably some dimness of vision which is due not only to the changes in the capsule of the lens, but also to those in the deeper structures of the eye which are always involved to a greater or less extent.

Iritis usually presents such marked symptoms that it is easily recognized by any competent person; and yet every ophthalmic surgeon must have met with not unfrequent instances in which through carelessness or ignorance it has been mistaken for simple conjunctivitis and treated solely with collyria of nitrate of silver, sulphate of zinc, etc. A few cases, however, are met with in which the most experienced surgeon may for a day or two fail to make a diagnosis. This generally occurs at the commencement of the disease, before any marked changes have taken place in the iris, and especially when the conjunctival vessels have been congested by the application of poultices. Impairment of vision will afford valuable aid to the diagnosis and the instillation of a drop of a solution of atropine will soon decide the question, by showing irregularity of the pupil if the case be one of iritis.

I have already remarked that the diagnosis of syphilitic iritis, although rendered highly probable by the absence of severe pain and photophobia, and the presence of tubercles upon the iris, can only be satisfactorily established by the history of the case or the coexistence of undoubted syphilitic symptoms. I would also add that the presence of any general eruption upon the body leaves scarcely room to doubt that a coexisting iritis is of specific origin, since this disease, when due to other causes, is very rarely accompanied by affections of the skin. The practical surgeon when called to treat a case of iritis, almost instinctively turns to the arms, chest, and abdomen, to look for traces of one of the syphilodermata, to the throat for mucous patches, and to the neck for engorged ganglia. As noticed by Carmichael, the accompanying eruption is in most cases papular.

The second form of iritis, to which I have referred, is met with

as a symptom of tertiary syphilis, and differs from the preceding chiefly by the insidious manner in which it attacks the eye, and by its greater persistency. There is almost a complete absence of pain and photophobia; the iris becomes infiltrated and covered with lymph, and has a peculiar swollen and velvety appearance; numerous adhesions take place between its pupillary margin and the capsule of the lens; and the irregular pupil is blocked up with an effusion of lymph, upon which small, black, uveal deposits may often be detected. Both eyes are generally attacked in succession; the disease is exceedingly persistent, and with difficulty controlled by treatment; and the danger of complete loss of sight from obstruction of the pupil is very great. The deeper structures of the eye appear to be implicated to a less extent than in the acute form.

Among the absurdities of medical belief that have had their day is to be reckoned the idea that mercury may give rise to iritis—a disease which is often met with when no specific remedy has been employed, and which can in no way be better controlled than by the judicious use of mercurials; indeed, the surgeon rarely has an opportunity of witnessing a more remarkable effect of treatment than is seen in the absorption of lymph, the disappearance of the abnormal injection, and the restoration of the iris to its original condition, which take place under the administration of mercury in acute syphilitic iritis. It is hardly necessary to say that an agent of so much good is capable of doing a great amount of harm, and that I am here speaking of its use and not of its abuse.

The plan of treatment of the acute form of iritis which I have found almost uniformly successful, has, for its objects—

1. To bring the system under the influence of mercurials as speedily as possible, without injury to the general health, and without inducing salivation.

2. In a depressed state of the system, to combine tonics with mercurials, or to employ the former in connection with iodide of potassium instead of the latter.

3. To keep the pupil constantly dilated by means of atropine, and thus prevent adhesions between the iris and capsule of the lens.

4. To relieve pain and regulate the general hygienic management of the case.

The subjects of these different heads will be somewhat briefly considered in view of the fact that most of them have been included in what has been said of the general treatment of syphilis.

In persons of a fair state of health, no form of mercurial is pref-

erable to the ordinary pill of calomel and opium (one grain of the former to a quarter or half a grain of the latter) administered three times a day—an hour after meals. When the general condition of the system is depressed, a tonic should be combined with the mercurial; and the following formulæ are most frequently employed at the N. Y. Eye Infirmary, where the patients are, for the most part, of the poorer class, and under unfavorable hygienic influences:—

℞. Hydrargyri cum cretâ gr. ij.
Quiniæ sulphat. gr. j.
M. et ft. plv.

℞. Hydrargyri cum cretâ gr. ij.
Quiniæ sulphatis gr. j.
Pulveris Doveri gr. iij.
M. et ft. plv.

The latter formula containing Dover's powder is to be preferred when the pain is severe. The frequency of the administration of these powders is to be determined by the strength and general condition of the patient. Under ordinary circumstances, one may be given three times a day; or, when the system is much depressed, one morning and night, with one or two grains of quinine in addition twice during the day; and when thus guarded by quinine, mercury may be employed in nearly every case of this disease. It is well to prolong the use of this remedy until evidence of its action upon the mouth is perceptible, but not to continue it until salivation is produced. So soon as the gums are in the slightest degree affected, the mercurial should be suspended, and chlorate of potash employed, while at the same time the tonic may be continued.

The opposite eye will sometimes be attacked while the patient is taking mercury for the one first affected, and, in rare instances, even during the existence of ptyalism; just as a new eruption will occasionally appear upon the skin while undergoing treatment for an old one.

It will be observed that the above mode of employing mercury in combination with quinine, as practised for many years at the New York Eye Infirmary, is widely different from the exclusive use of this mineral, which has been recommended by some authors. It would be out of place in the present work to enter into a discussion of the comparative merits of the two methods, and I must, therefore, content myself with expressing a strong preference for the one here proposed; merely adding, that it is equally as true of iritis, as of other syphilitic manifestations, that the administration

of mercury, without regard to the condition of the patient, is quite as likely to do harm as to do good.

My friend, Dr. Henry W. Williams, of Boston, has adduced sixty-four cases of iritis, dependent upon various causes, to show that the treatment of this disease may be successfully conducted without mercury, by means of quinine, iodide of potassium, narcotics, and mydriatics. There appears to be no good reason why we should lay aside so valuable an agent as mercury, provided it be not abused. In a large number of cases of iritis, treated by my colleagues and myself, at the Infirmary, I have never seen any unfavorable influence upon the general health; and repeated trials of Dr. Williams's method by Dr. C. R. Agnew and myself, have convinced us both that the results are less satisfactory than when mercury is employed. In two instances, permanent impairment of vision ensued, which we had reason to believe might have been prevented by the use of mercurials; and in all the duration of the disease was considerably prolonged.

It is of the first importance in the treatment of iritis to maintain the pupil in a constant state of dilatation, so as to remove the iris as far as possible from the convex surface of the lens, and prevent adhesions or closure of the pupil with lymph. For this purpose, instillations of a solution of atropine are far preferable to extract of belladonna smeared upon the brow. In addition to its power of dilating the pupil, atropine is a most valuable sedative—a rare combination in the same remedy. Two grains of the sulphate to the ounce of distilled water, first dissolved in a few drops of dilute sulphuric acid, is the formula which I commonly employ. This solution is best applied to the inner canthus by means of a camel's-hair brush; in default of which, the patient's head may be thrown back, and a small portion of the fluid be poured upon the concavity upon the side of the nose, when some of it may readily be made to flow between the lids. If the case be seen at the outset, before the motions of the iris are impeded by an infiltration of lymph, two or three times a day will be sufficiently often to use the drops. In the acute stage of iritis, some authors advise us entirely to abstain from the use of atropine and belladonna, which have but little power of influencing the pupil after effusion has taken place, and which, it is said, may "irritate and tease the iris, and cause pain."[1] My own experience leads me to believe that these fears are groundless. Instead of aggravating, I believe that atropine greatly relieves the

[1] CRITCHETT, Lectures on Diseases of the Eye, London Lancet, Am. ed., March, 1855, p. 216.

pain and irritation, and although its immediate action upon the pupil is not perceptible, yet it gradually stretches or breaks down the adhesions already formed, and thus assists the iris in recovering its dilatability; hence I am in the habit of even increasing the frequency of the instillations, during the acute stage, to three or possibly four times a day. Care should be taken, however, that the atropine, some of which gains the pharynx through the lachrymal and nasal passages, does not produce its physiological effects upon the general system.

Venesection is never required in syphilitic iritis, and local depletion by means of cups and leeches is advisable in only a few cases in robust subjects. After the acute stage has passed, counter-irritation is best effected by painting the brow with the strong tincture of iodine.

It is highly important that the patient should obtain sleep, for which purpose ten grains of Dover's powder may be given at bedtime, and repeated if necessary. In many cases, however, frictions upon the brow and temple at bedtime of mercurial ointment, with the addition of powdered opium (ung. hydrarg. ℥j, plv. opii ʒj) will suffice to allay pain and procure sleep.

In this, as in nearly all affections of the eye, the surgeon has to contend with the deeply-rooted prejudices of the masses in favor of poultices of bread and milk, tea leaves, alum curds, raw oysters, pieces of pork, *et id genus omne.* Not only should all such vile applications be put far away, but the eye should not be tied up with handkerchiefs or cloths in any manner. In women, the best protection against the strong light is a veil; in men, a pasteboard shade will answer the same purpose.

In unfavorable weather, or in unusually severe cases of iritis, the patient should be confined to the house, or even to his room, which should be shaded but not darkened. In most cases, however, when the weather is fair, it is desirable that the patient should pass a portion of the day out of doors, in the early morning or evening, if the intolerance of light be excessive, and with the eyes protected in the manner above directed. Photophobia and irritability of the eye will be aggravated by confinement to a dark room.

The diet must be proportioned to the general condition of the system. Robust subjects should take but a small quantity of light food; while the cachectic require an abundant supply of nourishment, and, it may be, stimulants. Proper attention should also be paid to the digestive organs, and a daily evacuation of the bowels secured.

TABULAR STATEMENT OF TWENTY-ONE CASES OF INFANTILE IRITIS.

NO.	NAME, HOSPITAL, REFERENCE, ETC.	AGE.	PARENTS' HISTORY.	INTERVAL BETWEEN PROBABLE SYPHILIS IN PARENTS AND BIRTH OF CHILD.	SYMPTOMS PRESENT AT THE TIME IN THE CHILD.	WHICH EYE AFFECTED.	TREATMENT AND RESULT.	REMARKS.
1	Jane M.; Mr. Lawrence.	16 months.	The mother had contracted syphilis three months before her confinement.	3 months.	Vaginal discharge and condylomata at the anus.	The left only.	Complete recovery of the eye under mercurial treatment.	The first recorded case of infantile iritis.
2	Sex not stated; Maunsell and Evanson.	11 months.	Its father had at the time a tubercular syphilide.	Probably short.	No details given.	In one eye only.	No details given.	This appears to have been the only example of infantile iritis witnessed by the authors quoted.
3	"A child;" Dr. Jacob.	A few months.	No details.	No details.	No details. The child had unmistakable symptoms when under notice.	No note.	No treatment had been adopted, and the pupil was closed by adhesions.	Dr. Jacob did not see the patient until three years after the attack.
4	Mary O.; Mr. Walker.	5 months.	No details.	No details.	A copper-colored rash, of four months' duration.	The right only.	Both rash and iritis were cured by mercurial treatment.	Mr. Walker states that he has seen several, but this is the only case of which he gives details.
5	Mary Ann W.; Mr. Dixon; the Ophthalmic Hospital.	9 weeks.	Both patients denied having had syphilis.	Not known.	Scaly, copper-colored eruption; loss of eyelashes; peeling of cuticle; sore mouth.	Both eyes.	Under the use of mercurials every trace of the effused lymph was removed from both eyes.	The treatment was not commenced until the disease had existed three weeks.
6	William J. J.; the Ophthalmic Hospital; Mr. Dixon.	4 months.	The mother had had sores, followed by rash, a few weeks before her confinement.	2 months (?).	A dusky, red eruption.	The right first; subsequently the left.	Under mercurial treatment the left eye wholly cleared; the pupil of the right was left occluded.	In this case the child was at the date of the iritis, "healthy-looking, well-grown, and lively."
7	Harriet H.; the Hospital for Diseases of the Skin; (the writer's own notes.)	8 months.	Mother covered with a secondary syphilitic rash. Child illegitimate and first-born.	A few months.	Emaciation; cachexia; ulcerated condylomata.	The right first, and two months later the left.	Complete recovery of both eyes under mercurial treatment continued for several months.	
8	Emily C; St. Bartholomew's; Mr. Wormald.	3 months.	The mother denied all history; father not seen.	Not known.	Snuffles; emaciation; sore mouth; syphilitic psoriasis.	The left only.	The patient was lost sight of before the case was complete.	
9	Christopher T.; Hospital for Diseases of the Skin; (the writer's own notes.)	8 months.	Mother under treatment for a syphilitic rash. A first-born child.	A few months.	Had been attending for 4 months on account of a syphilitic rash, which was disappearing.	One eye only.	The iris cleared perfectly under mercurial treatment.	Previous mercurial treatment did not prevent the iritis.
10	Sarah P.; St. Bartholomew's; Mr. Wormald; (the writer's own notes.)	5 months.	The mother had lost five infants with suspicious symptoms, and this was her only living child.	Not known (probably six years).	Syphilitic psoriasis; condylomata; emaciation.	The right only.	The pupil was wholly occluded; no treatment had been adopted for three months.	

TABULAR STATEMENT OF TWENTY-ONE CASES OF INFANTILE IRITIS.—*Continued.*

NO.	NAME, HOSPITAL, REFERENCE, ETC.	AGE.	PARENTS' HISTORY.	INTERVAL BETWEEN PROBABLE SYPHILIS IN PARENTS AND BIRTH OF CHILD.	SYMPTOMS PRESENT AT THE TIME IN THE CHILD.	WHICH EYE AFFECTED.	TREATMENT AND RESULT.	REMARKS.
11	Alice K. C.; the Ophthalmic Hospital; Mr. Critchett.	2 months.	Her mother had borne 8, 6 of whom were still-born, and one died with suspicious symptoms. The patient was the only living one.	Not known (probably seven years, or eight years).	Emaciation and cachexia; syphilitic psoriasis; tinea tarsi; psoriasis palmaris.	Both.	The result was not known, owing to the patient's irregularity of attendance.	
12	Anna L.; the Ophthalmic Hospital; Mr. Critchett.	3 months.	Two previous infants had died; the mother showed suspicious sores at the angles of the mouth.	Not known (probably two or three years).	Cachexia and emaciation; fissures at oral angles; psoriasis of arms and hands.	Right eye only.	Mercurial treatment; no record of result.	
13	Emily W.; the Ophthalmic Hospital; Mr. Critchett.	10 months.	All history denied; but four infants had died with suspicious symptoms.	Not known (probably several years).	Emaciation and cachexia; had had sore mouth and anus.	Right eye.	The pupil was occluded by dense, yellow lymph, of two months' duration, when the mercurial treatment was begun; great improvement followed.	
14	A girl; St. Bartholomew's; Mr. Wormald.	16 months.	The mother confessed to having had syphilis.	Probably only a few months, but uncertain.	No details.	Left first; the right 8 months afterwards.	The lymph which had been abundant, was absorbed under mercurial treatment, but left the left pupil closed.	
15	James C.; Ophthalmic Hospital; Mr. Critchett.	2 months.	No notes.	Not known.	Snuffles; scaly rash; ulcers at anus.	Both.	The right eye recovered under mercurial treatment, but the left pupil was occluded.	
16	Wm. John J.; Ophthalmic Hospital; Mr. Critchett.	9 weeks.	Mother suffering from suspicious symptoms, but not aware of primary sores.	Not known (probably a few months).	Snuffles; ulcerated condylomata at anus; syphilitic eczema.	Left only.	Recovered under mercurial treatment.	
17	James W.; Ophthalmic Hospital; Mr. Macmurdo; Mr. Moon's notes.	14 months.	Father known to have had syphilis.	Not known.	Cachexia; an eruption.	Both.	The right eye improved under mercurial treatment, but the left had probably been destroyed.	In the right eye there appeared to be deep-seated effusion of lymph, probably choroidal.
18	A girl; the Ophthalmic Hospital; Mr. Dixon.	4 months.	Both parents had had syphilis.	11 months.	Condylomata at anus.	Both.	Both pupils were almost closed by iritis, which had occurred two months before, and had not been treated.	The child looked as if in excellent health.
19	A girl; the Ophthalmic Hospital; Mr. Hulke.	7 months.	Both parents had suffered from primary syphilis four months before the infant's birth.	4 months.	Cachexia and emaciation; hydrocephalus; snuffles.	Right only.	The right pupil was closed by red, organized lymph.	
20	Emma D.; Ophthalmic Hospital; Mr. Dixon.	4 months.	The father had had syphilis fourteen months before the infant's birth.	14 months.	Snuffles; sore tongue; copper-colored psoriasis; psoriasis at anus.	Right only.	The inflammation had not been treated, and the pupil was wholly closed.	
21	Mary L.; the Ophthalmic Hospital; Mr. Dixon.	7 weeks.	No notes.	Not known.	Copper-tinted psoriasis; snuffles; separation of the nails.	Both.	Mercurial treatment was early adopted, and both eyes perfectly recovered.	In this instance the child was well-grown.

The chronic form of iritis met with in tertiary syphilis most frequently occurs in persons whose constitution is enfeebled, and by whom mercury is poorly tolerated; but when properly guarded by tonics, this mineral may still, in many cases, be used with marked benefit; in others we are obliged to resort to iodide of potassium, until by every available means the general health is restored. Mercurial inunction or fumigation may often be employed, when mercury by the mouth cannot be borne.

I must refer the reader to works upon ophthalmic surgery for a description of the operations intended for the relief of closure of the pupil, the effect of iritis.

Infantile Iritis. — An extremely interesting form of iritis is met with in infants affected with hereditary syphilis. It is a rare disease, but probably exists in many instances in which it is overlooked. Many of the cases hitherto reported are included in the preceding table prepared by Mr. Jonathan Hutchinson; and the conclusions deducible from them are from the pen of the same author.[1]

Mr. Hutchinson deduces the following conclusions from the above series of cases:—

1. That the subjects of infantile iritis are much more frequently of the female than the male sex.

2. That syphilitic infants are most liable to suffer from iritis at about the age of five months.

3. That syphilitic iritis in infants is often symmetrical, but quite as frequently not so.

4. That iritis, as it occurs in infants, is seldom complicated, and is attended by but few of the more severe symptoms which characterize the disease in the adult. Haziness of the cornea and photophobia, which are common in adults, are rare in infants, in whom there is also but little pain and sclerotic injection.

5. Notwithstanding the ill-characterized phenomena of acute inflammation, the effusion of lymph is usually very free, and the danger of occlusion of the pupil great.

6. Mercurial treatment is most signally efficacious in curing the disease, and, if recent, in procuring the complete absorption of the effused lymph.

7. Mercurial treatment previously adopted does not prevent the occurrence of this form of iritis.

8. The subjects of infantile iritis, though often puny and cachectic, are also often apparently in good health.

[1] Medical Times and Gaz., July 14, 1860.

9. Infants suffering from iritis almost always show one or another of the well-recognized symptoms of hereditary taint.

10. Most of those who suffer from syphilitic iritis are infants born within a short period of the date of the primary disease in their parents. This accords with what is observed in the iritis of adults, which, in a great majority of instances, is a secondary and not a tertiary symptom.

I have seen only one instance of this affection in an infant at the Infirmary, who was not brought a second time, and whose case I was therefore unable to follow out. I have at present in charge a case of double chronic iritis in a boy aged 10, affected also with engorgement of the cervical ganglia, who, as reported by his father, was said, by the attending physician (Dr. G. L. Bedford), to have contracted syphilis from his wet-nurse. I may mention incidentally, that his teeth are generally misshapen, and that one of his upper incisors is completely perforated by a small hole about one-third of its length from the lower margin.

RETINITIS AND CHOROIDITIS.—The subjective symptoms of these two affections are often so slightly marked at their commencement as to attract but little attention either from the patient or surgeon, and irreparable mischief may be done before their gravity is fully appreciated. I have repeatedly met with cases of syphilis in which some slight complaint from the patient has led to an ophthalmoscopic examination of the eye disclosing the existence of a disease which threatened the loss of sight, but which was subsequently arrested by appropriate treatment.

The symptoms of retinitis and choroiditis of syphilitic origin do not differ from those of the same affections dependent upon other causes. In most cases the patient first perceives a fog or mist before the sight, attended perhaps by a sensation of fulness in the globe, muscæ and frontal headache or hemicrania; the excessive photophobia formerly insisted on as a symptom of retinitis is rarely present; the obscuration of vision gradually progresses until finally the capability of distinguishing between light and darkness alone remains, or the eye becomes entirely blind. These subjective symptoms cannot enable us to distinguish between retinitis and choroiditis, which have only quite recently been recognized by the use of the ophthalmoscope, which has rendered the examination of the deeper structures of the eye nearly as easy as that of the external.

In order to explain the ophthalmoscopic appearances of *retinitis*,

it is necessary to premise, that in a state of health, the retina, which is an expansion of the optic nerve, is perfectly transparent and enables us to see through it the abrupt margin of the sclerotica, forming the boundary of the optic disk—the whitish circle visible upon ophthalmoscopic examination at the fundus of the eye. Now the natural effect of inflammation upon this transparent membrane is to give it increased vascularity, and cause effusion into its substance and render it opaque. Hence one of the earliest signs of retinitis is increased redness, which may commence either upon the optic nerve-entrance, imparting to it a pinkish hue, or peripherally in the retina; the vessels, both arteries and veins, which emerge from the optic disk to be distributed to the retina are also abnormally enlarged, injected, and tortuous; and at certain points of their course they are lost to view, owing to the opacity of the retinal tissue which covers them. Their rupture may also give rise to small patches of ecchymosis. Again, effusion into the substance of the retina first impairs its transparency, and produces the appearance of a fog or haze in the fundus of the eye, and finally entirely conceals the entrance of the optic nerve, the site of which can only be determined by the convergence of the dilated veins. The obscurity of the deeper structures may also be increased by transudation into the vitreous humor.

The ophthalmoscopic appearances of *choroiditis* are very numerous, but are nearly all dependent upon various degrees of atrophy of the choroid, permitting the white sclerotic to be seen through the thinned portions. At an early stage of the disease, when the atrophy is confined to the internal and pigmentary layers of the choroid, a condition known as "maceration of the pigment of the choroid" is seen; the coloring matter is distributed irregularly, thinned in some portions and aggregated in others, giving the fundus of the eye a mottled or watered appearance, as if sprinkled with ink. Again, the atrophy may be confined to circumscribed patches, of an almost pearly white color, and in striking contrast with the general pinkish hue of the fundus of the eye; or it may be general, in which case the internal chamber of the organ of sight reflects an unusual amount of light. Deposits of lymph in the retina may also give rise to light-colored patches, similar to those produced by atrophy of the choroid; but the former may be recognized from the fact that they conceal the choroidal and retinal vessels, which in the latter may be seen to cross the patch.

Exudation from the choroidal vessels may produce sub-retinal effusions, which are generally limited to one portion of the fundus

and prevent vision in the opposite direction; for instance, if the effusion be situated externally, the patient can see outwards but not inwards; if inferiorly, he can see downwards but not upwards. These effusions present a very characteristic appearance before the ophthalmoscope and resemble a large semi-transparent bleb or bulla, encroaching upon the vitreous and oscillating to and fro. The retinal vessels may be seen leaving the attached retina and ascending upon the surface of the detached portion.

The use of the ophthalmoscope has as yet been so little extended, that it is not to be expected that the above symptoms can always be recognized by the general practitioner. The important facts to be borne in mind are these: that the instrument referred to has demonstrated the existence of deep-seated changes in the eye produced by syphilis and threatening the loss of sight; and hence that any impairment of vision in syphilitic subjects, although unattended by symptoms of external inflammation, should at once put the surgeon upon his guard and lead him to resort to specific remedies.

I have met with several cases of syphilitic retinitis occurring at various intervals after iritis. The wife of the patient referred to upon page 405, suffered from this disease fifteen months after her attack of iritis, and at a time when no other syphilitic symptoms were present. In this case the disease was promptly removed by mercurials; and the prognosis is generally favorable in otherwise healthy persons, provided specific remedies be employed in time. Indeed, with respect to the success attending appropriate treatment, syphilitic choroiditis and retinitis resemble syphilitic iritis.

Atrophy of the Optic Nerve.—I have met with several cases of atrophy of the optic nerve in syphilitic subjects, which was apparently dependent upon the constitutional taint. This disease may be recognized upon examining the fundus of the eye with the ophthalmoscope, by the peculiarly white and opaque color of the optic papilla, and by the small size of the central vessels; and there is partial, and, in many cases, almost complete loss of vision. The prognosis is highly unfavorable, and I have never seen benefit from the use of remedies.

Hyperopia.—I have also repeatedly observed hyperopia giving rise to convergent strabismus in several children of the same family, the father of which labored under syphilis before marriage, and the question has arisen whether this anomaly of refraction might not in some instances be due to inherited syphilitic taint. The only remedy

consists in an operation for the strabismus, and correcting the hyperopia by means of convex glasses.

PARALYSIS OF THE MOTOR NERVES OF THE EYE.—It is a frequent remark of my esteemed friend Dr. Abram Du Bois, who, from his long attention to diseases of the eye both in private practice and at the New York Eye Infirmary, is eminently qualified to judge, that a large proportion of cases of paralysis of the motor nerves of the eye are due to syphilis; and this statement is fully confirmed by my own more limited experience. Graefe[1] also attributes this class of affections to syphilitic taint "in nearly half of all the cases met with."

In most instances, it is the third pair, or motor oculi, that is affected; next in order of frequency comes the sixth pair, or abducens;[2] and finally the fourth pair, or patheticus.

My limited space compels me to refer the reader to treatises upon diseases of the eye for a description of the symptoms of these affections.[3] I will merely remark, that the surgeon should carefully avoid confounding paralysis of the sixth pair with converging strabismus. The two may readily be distinguished by the fact that, in the former, the patient is unable, under any circumstances, to turn the eye outwards; while, in the latter, if the straight eye be covered, the squinting eye resumes its normal direction. Attention to this point will enable the surgeon to avoid an error which I have known to be committed, viz., that of resorting to division of the internal rectus, which can be of no use whatever while the external rectus is paralyzed.

The pathology of paralysis of the motor nerves of the eye is often obscure. Dixon[4] relates two highly interesting cases, in which examination after death revealed the existence of tumors (supposed to consist of syphilitic tubercle) in the substance of the nerve. The paralysis is rarely due to disease of the bony passages, or their lining membrane, traversed by the nerve, but has been traced upon post-mortem examination to softening of the nervous or cerebral tissue. Virchow[5] quotes a number of cases dependent upon the last-mentioned cause.

[1] Syphilitic Affections of the Eye, Deutsche Klinik, 1858, No. 21.

[2] Dr. Beyram has related three interesting cases of paralysis of the sixth pair due to syphilis, L'Union Médicale, Feb. 23, 1860.

[3] See an able article, by Dr Wells, giving an account of Graefe's researches upon paralytic affections of the eye, Ophthalmic Hospital Reports, vol. ii., p. 44.

[4] Med. Times and Gaz., Oct. 23, 1858.

[5] Syphilis Constitutionnelle, p. 129, et seq.

These affections of the motor nerves are generally met with in the tertiary stage of syphilis, and in most cases yield to iodide of potassium; indeed, the facility with which they are affected by treatment, would seem to preclude the idea that they are necessarily dependent upon serious organic changes either in the nerve or brain.

CHAPTER XV.

SYPHILITIC AFFECTIONS OF THE EAR.[1]

[THE affections of the ear which may arise in the course of syphilis, as evidences of the presence of the syphilitic poison, are—

I. INSPISSATED CERUMEN.

II. SUBACUTE MYRINGITIS.

III. INFLAMMATION OF THE EUSTACHIAN TUBE, AND OF THE CAVITY OF THE TYMPANUM.

The first-named abnormal condition of the external auditory canal arises from the extension of the congested condition of the skin to the meatus, which is lined with the inflection of the common integument, and in no respect differing from it, except that it is somewhat thinner, especially where it forms the outer layer of the membrana tympani. This collection of cerumen may, by pure mechanical pressure, cause inflammation of the membrana tympani, which will require treatment after the inspissated cerumen has been removed.]

Patients not unfrequently complain of deafness suddenly supervening in the course of general syphilis, and evidently dependent upon the constitutional taint, since it coincides with well-marked syphilitic manifestations, and yields to specific remedies. In most of these cases, as ordinarily met with in practice, the disease consists in inflammation of the tympanal membrane, as is evinced by the abnormal redness and vascularity of the drum, and by the diminution in size or total absence of the conical-shaped reflection of light which is seen in a normal ear, if an examination be made of the external auditory canal. For this purpose a tubular speculum (either Mr. Wilde's or Mr. Toynbee's) is far preferable to a bivalve instrument, and the ear should be exposed to the direct rays of the sun, or to ordinary daylight reflected from the concave mirror of

[1] Dr. D. B. St. John Roosa, Assistant Surgeon at the N. Y. Eye Infirmary, where he has special charge of diseases of the ear, has kindly consented to revise the following chapter, and to add those portions included in brackets.

Tröltsch. As a general rule, the accompanying pain is less than in acute myringitis of simple origin, and in some instances is entirely absent; but in others it is very severe, radiating over the side of the head, and increased by coughing, sneezing, swallowing, blowing the nose, pressure in front of the meatus, and the motions of the jaw. There is no abnormal discharge from the external ear. If the disease be allowed to go on unchecked, lymph may be effused between the lamellæ of the drum, producing permanent impairment of hearing.

Mr. Wilde, of Dublin, in his able work upon diseases of the ear,[1] was the first to call attention to this affection, and to show that the deafness arising in the course of general syphilis is, in most cases, dependent upon subacute myringitis. A number of cases have been observed by my colleagues and myself at the New York Eye Infirmary, and I have met with others in private practice, in which the truth of Mr. Wilde's statement has been fully confirmed, and in which the pathology of the disease could not be mistaken. I feel obliged to dissent, however, from this author's assertion that syphilitic myringitis is "unaccompanied by local pain," which, although generally less than in simple acute myringitis, was quite severe in several of the cases referred to—a point which has also been confirmed by my friend, Dr. C. R. Agnew.

The character of the co-existing symptoms, and the amenability of the disease to mercury, indicate that syphilitic myringitis should be ranked among secondary lesions; indeed, its position in the syphilitic scale may be regarded as nearly identical with that of the secondary form of iritis, with which it possesses several points of analogy.

The treatment of this affection consists in the active employment of mercurials internally, together with opiates, if required for the relief of pain; and in the internal application of leeches in front of the tragus, or within the meatus auditorius. According to Tröltsch, warm water poured into the meatus is preferable to poultices, which may relax the tissues so much as to excite suppuration and induce a troublesome otorrhœa. When the acute inflammation has been subdued, if any effusion of lymph be visible in the substance of the drum, or if the function of the organ be not completely restored, the administration of iodide of potassium in conjunction with mercurials, and blisters behind the ear, should be resorted to.

[Inflammation of the Eustachian tube may extend from the mem-

[1] Practical Observations on Aural Surgery, etc., Phil., 1853, p. 252.

brane of the pharynx and the soft palate, the muscles of which—the levator and tensor palati—have an intimate connection with the orifice of the Eustachian tube. Impermeability of the tube may result either from the loss of power of these muscles thus producing insufficiency, or from extension of the inflammation and ulceration. This impermeability of the tube will of course prevent the free interchange of air in the cavity of the tympanum, favor mucous collections, adhesions, congestion, inflammation and deafness. The indications of treatment are to act upon the diseased membrane by astringents, removing the obstruction of the canal by the use of the Eustachian catheter, blowing through it simple or medicated vapor, and at the same time pursuing antisyphilitic general treatment.]

CHAPTER XVI.

SYPHILITIC ORCHITIS.

A DISEASE of the testicle, dependent upon syphilis, was recognized by Astruc,[1] who speaks of its indolent character, and contrasts it with the acute inflammation of gonorrhœal testicle; it was unknown to Hunter, but was noticed by Bell,[2] and, more recently, has been described by Sir Astley Cooper,[3] Bérard,[4] Velpeau,[5] and others; but our present knowledge of this affection is chiefly due to Ricord, who has given a most faithful description of its symptoms, pathology, and treatment, under the name of syphilitic albuginitis.

Syphilitic sarcocele, orchitis, or albuginitis, as it is variously termed, is one of the so-called transition symptoms of syphilis, on the confines between secondary and tertiary lesions, but more closely allied to the latter than the former. When the constitutional disease runs a rapid course, it may sometimes occur as early as the fourth or fifth month after contagion, while secondary symptoms are still present; but, in the majority of cases, it does not appear until several years after the primary sore, and is accompanied by well-marked tertiary manifestations in the fauces, periosteum, or bones; or, in some instances, it stands alone as the only evidence that the patient is still affected with the syphilitic poison. The statement that "it may appear at the same time with primary chancre," or, in other words, that a chancre and syphilitic orchitis, due to the same contagion, may be developed contemporaneously, is too absurd to require refutation.

SYMPTOMS.—In most cases, syphilitic orchitis attacks both testicles either at the same time or consecutively. Its symptoms are deserving of special attention, since it may readily be confounded with other

[1] Book III., chap. iv.
[2] Treatise on Gonorrhœa Virulenta and Lues Venerea, vol. ii., p. 128.
[3] Structure and Diseases of the Testis.
[4] Des Divers Engorgements du Testicule, Paris, 1834.
[5] Dictionnaire de Méd.

affections of the testis which require extirpation. The records of surgery show that many testicles have been removed for what is now known to be an essentially curable disease.

One of the most characteristic features of this affection is the almost entire absence of pain attending it and the great insensibility to pressure; whenever, therefore, a testicle becomes enlarged without any of the ordinary signs of inflammation in a person who has once had syphilis, there is strong reason to suspect that the disease is due to syphilitic taint. In exceptional instances, a dull pain is felt about the loins, but generally the only uncomfortable sensation is a feeling of weight in the affected organ, which is worse towards evening after the patient has been upon his feet during the day, but which does not undergo the nocturnal exacerbation so common to syphilitic pains situated in the periosteum and bones. Moreover, as the disease progresses, the testicle appears to lose even its normal sensibility, and may be roughly handled without causing the slightest uneasiness.

Another important feature is the entire absence of morbid changes in the scrotum, vas deferens, and epididymis. The healthy condition of the cord and of the covering of the testicle is evident throughout the whole course of the disease; the same fact may be established in the epididymis at an early and still holds good at a later period, although, when the swelling attains a considerable size, it is sometimes impossible to distinguish the different portions of the organ.

The body of the testicle, which is always the part affected, is somewhat increased in size but never to the same extent as in encephaloid disease of the same organ; and it rarely exceeds twice its normal diameter. Ricord was in the habit of saying at his lectures, "Whenever you meet with a tumor of the testis as large as your fist, and find that the swelling is not in a great measure due to effusion, you need not suspect syphilis." In most cases, a small portion of the apparent swelling is dependent upon hydrocele; since in nearly every instance of syphilitic orchitis, there is a slight effusion into the tunica vaginalis. When the amount of fluid is considerable, it may be necessary to evacuate it by puncture with a broad needle before a satisfactory examination can be made; but in most cases, we may by firm pressure sufficiently displace the fluid to reach the body of the testicle and determine its condition by palpation. At an early stage of the disease, the testicle is found to contain one or more distinct masses of induration, which may form slight projections upon the surface, of the size of the head of a pin, pea, or even an almond, but which are never so prominent as to change the general

contour of the organ. These projections are due to an effusion of plastic material, of the same nature as gummy tumors, upon the surface of the tunica albuginea. As the disease progresses, the distinct masses of induration coalesce and form a hard resistant tumor, which still preserves to a great extent the normal shape of the testicle.

The course of this affection is exceedingly slow and chronic, frequently lasting for several years. The sexual desires are not changed, unless the disease has made great progress in both testicles.

When recognized at a sufficiently early period, syphilitic orchitis may almost invariably be arrested and the organ restored to its original integrity. If left to itself it most frequently terminates in obliteration of the seminiferous tubes, and complete or partial atrophy corresponding to the extent of the adventitious deposit; or, again, the parenchyma of the gland may degenerate into fibrous, cartilaginous, or even osseous tissue. Ricord has laid down the law that suppuration never takes place in uncomplicated syphilitic orchitis, and has shown that many supposed cases to the contrary were really instances of tubercular disease of the testis or gummy tumors of the cellular tissue of the scrotum. This law has generally been admitted as correct, and has not until recently been called in question; but Rollet[1] has reported an unquestionable instance of this disease in which the substance of the testicle protruded through an ulceration of the scrotum and the tunica vaginalis and albuginea, giving rise to the condition known as fungus of the testicle; and also quotes a similar case, witnessed by himself, from Jarjavay, and refers to another described by Curling.[2] Victor de Meric[3] has reported still another instance of fungus of the testicle dependent upon syphilis. It would appear, therefore, that Ricord's law is not without exception.

DIAGNOSIS.—Syphilitic orchitis may be confounded with gonorrhœal epididymitis, with cancer, tubercular disease of the testis, or chronic orchitis.

Gonorrhœal inflammation of the testis is an acute disease, attended with severe pain, difficulty of motion, redness, heat, and tension of the scrotum; chiefly attacking the epididymis; often complicated with inflammation of the vas deferens; preceded or accompanied by a discharge from the urethra; and yielding to simple treatment. The induration left by an acute attack of swelled testicle may be

[1] Annuaire de la Syphilis, année 1848, p. 90.
[2] On the Testis, 2d ed., p. 277.
[3] London Lancet, Am. ed., May, 1859.

recognized by the previous history of the case and by being limited to the epididymis.

In cancer of the testicle, which is generally of the encephaloid variety, the pain is slight at the commencement, but increases with the progress of the disease and becomes very severe and lancinating; the tumor is very irregular, grows with great rapidity, and often attains an immense size; and the cord and neighboring ganglia are frequently involved. "If you remove a cancerous testicle, the disease almost always returns in the cord; in a second attack of syphilitic orchitis, the opposite testicle is affected."[1]

Tubercular disease of the testis occurs about the age of puberty rather than in adult life, and in subjects presenting evidences of a strumous diathesis. The adventitious deposit first takes place in the epididymis, or in the centre and not in the external portions of the testis as in syphilitic orchitis; as the disease progresses, slight protuberances may be formed upon the surface as in the last mentioned disease, but they soon contract adhesions with the tunica vaginalis and scrotum, suppurate and ulcerate. Moreover, evidences of tubercular deposit may often be detected in the vesiculæ seminales by examination with the finger *per anum*, or in the cord and inguinal ganglia.

Great diversity of opinion exists, especially between English and French surgeons, relative to the frequency, nature, and symptoms of chronic orchitis. Mr. Curling, who may be taken as the representative of English views, regards this affection as quite common, and dependent upon a deposit, generally in circumscribed masses, of a peculiar yellow homogeneous substance in the body of the testicle, which frequently terminates in suppuration and benign fungus of the testis. Among the French, Nélaton maintains, justly, I think, that this description applies to true tubercular testis, and that Curling has also included under the head of chronic orchitis many cases of syphilitic albuginitis. He believes, with the generality of French surgeons, that chronic orchitis is an exceedingly rare affection; that it is due to plastic inflammatory infiltration, bearing no resemblance to tubercle, in the substance of the epididymis and body of the testicle, not circumscribed in well-defined masses, often very persistent, but capable of absorption without suppuration; that it often originates in irritation about the deeper portions of the urethra, and sometimes gives rise to a very peculiar condition of the sperm, which is of a reddish color, resembling thin currant jelly.[2]

[1] Dupuytren, Leçons Orales de Clinique Chirurgicale, 2d ed., t. iv., p. 236.

[2] Gaz. des Hôp., No. 14, 1857.

It is unnecessary to enter more minutely into the details of the differential diagnosis between syphilitic orchitis and the above mentioned diseases. If attention be paid to their prominent features as now described, especially when assisted by a knowledge of the history of the case and a careful search for coexisting syphilitic symptoms or traces of their previous existence, the surgeon will not often be left in doubt. If any uncertainty exist, the patient should always have the benefit of a trial of specific remedies before resorting to operative procedures.

TREATMENT.—In the treatment of this disease, Ricord relies almost exclusively upon iodide of potassium, administered in doses of from five to thirty grains three times a day. It would appear that Ricord is here somewhat inconsistent with his own doctrines, since he elsewhere recommends a mixed treatment consisting both of iodide of potassium and mercury in the transition symptoms of syphilis, among which he ranks syphilitic orchitis. In my own practice, I have been dissatisfied with the iodide of potassium alone and have obtained much more favorable results from its combination with mercury. For instance, in a case recently under my care, the patient had been taking ten grains of the iodide three times a day during two months for a tubercular syphilitic eruption, when my attention was first called to the affection of the testicle, which had either appeared or certainly had not improved during the treatment. The dose of the remedy was gradually increased to twenty grains three times a day without affecting the orchitis, which speedily improved after substituting half a grain of the protiodide of mercury for the iodide of potassium taken at noon, and continuing the latter remedy morning and night. In many cases, and especially in broken-down constitutions, it is better to employ mercurial inunction upon the inner portions of the thighs and axillæ together with the iodide of potassium and tonics internally.

Diday expresses himself very decidedly in favor of a mixed treatment. He says: "The treatment of this affection is of importance both as an element of diagnosis and as a means of recovery. I do not share the exclusive confidence of certain specialists in the employment of iodide of potassium alone in this disease. I grant it is an excellent remedy, and perhaps the best, if only one is to be used; but some credit, I think, should be reserved for mercury. Can we forget or deny the success which was obtained by Sir Astley Cooper and Dupuytren at a time when this metal alone had the responsibility as well as the honor of curing? And does not syphi-

litic chronology, in assigning to this lesion a position midway between secondary and tertiary symptoms, indicate that the most successful treatment will be one of a mixed character? In my own practice, experience has confirmed these anticipations. I confess that if it were necessary to choose between mercury and iodine, I would give up the former rather than the latter; but I am very positive that their simultaneous use is often indispensable. The association of these remedies is almost always sufficient, but careful observation of recent cases occurring in my practice would seem to warrant the conclusion that mercury acts better at the commencement of treatment and iodine afterwards; that the former possesses a decided superiority during two or three weeks, after which time it is powerless compared with the efficacy which the latter now acquires. If I were asked for an explanation of this peculiarity, the truth of which has been demonstrated by experience, I should say that mercury, by virtue of its anti-plastic property, is of service in rendering soluble the intertubular deposit so that it is more readily absorbed: and that iodine afterwards comes in to better advantage as a true specific, with its anti-syphilitic and anti-tertiary property, and stimulates the process of absorption."[1]

The experience of the surgeons of the New York Hospital, as reported by my friend Dr. Thos. M. Markoe,[2] has been similar, and decidedly against the exclusive employment of iodide of potassium.

Local treatment is of secondary importance, and, in most instances, may be entirely dispensed with, except that the testicles should be relieved of their own weight by a suspensory bandage. Judging from the case reported by Rollet, even a fungoid growth of the testicle projecting through an ulceration of the scrotum, will disappear and cicatrization take place under the use of constitutional remedies alone. The local treatment commonly recommended, and which perhaps in a few cases may be employed with advantage, consists in daily mercurial inunction upon the scrotum, or compression by means of straps of adhesive plaster as in swelled testicle from gonorrhœa. The effusion into the tunica vaginalis is in most cases soon absorbed under general treatment, but if excessive, may be evacuated by means of a lancet or broad needle. The danger of wounding the swollen testis is too great to admit of the use of a trocar as in the ordinary method of tapping for hydrocele.

[1] Nouvelles Doctrines sur la Syphilis, p. 499.

[2] New York Journal of Med., March, 1855, p. 204.

CHAPTER XVII.

SYPHILITIC AFFECTIONS OF THE MUSCLES AND TENDONS.

SYPHILITIC affections of the muscles, although noticed by Astruc,[1] attracted but little attention until investigated during the present century, more especially by Boyer,[2] Ricord,[3] Bouisson,[4] and Notta.[5] These affections may be enumerated as *muscular pains, muscular contractions,* and *muscular gummata* or *tumors.*

MUSCULAR PAINS.—Muscular pains dependent upon syphilis have already been described[6] as frequently accompanying the earliest outbreak of general symptoms; affecting by preference the neighborhood of the joints; often involving the fibrous as well as the muscular tissues; fleeting and changing in their character; relieved by pressure; and, in most cases, unattended by swelling, heat, or redness. In the tertiary period of syphilis, also, patients often complain of pains in the extremities, but these are dependent upon changes in the periosteum or bones, or upon deposits of syphilitic tubercle in the muscles, and are therefore to be regarded as merely symptomatic of lesions described in this and other chapters.

MUSCULAR CONTRACTION.—This singular effect of constitutional syphilis consists in a diminution in the length of one or more muscles, interfering with motion, but without the existence of other changes appreciable upon external examination. The muscles most frequently affected are the flexors of the upper extremity, and especially the biceps. Notta met with six cases, in two of which the disease

[1] A Treatise of Venereal Diseases, etc., translated from the Latin, London, 1754, vol. ii., p. 15.

[2] Traité pratique de la Syphilis, Paris, 1836.

[3] Notes to Hunter, 2d Am. ed., 1859, p. 458.

[4] Gaz. Méd. de Paris, 1846, p. 211.

[5] Mém. sur la Rétraction Muscul. Syph., Arch. Gén. de Méd., Dec. 1850, 4e série, t. xxiv., p. 418.

[6] See p. 510.

was confined to the biceps; in two others, to the biceps and supinator longus; and in the remaining case to the flexors of the fingers. The biceps has been affected with the same frequency in the cases reported by other observers.

The contraction comes on insidiously, and the first symptom noticed by the patient is an inability to extend the limb. On examining the affected muscle, no change is perceptible either in its size or texture; its power of contraction is normal; and there is simply a diminution in length, as shown by its tension when the limb is forcibly extended. In neither of Notta's six cases was the fleshy portion of the muscle sensitive to pressure; but in five, pain was excited by pressing upon one or both of the tendinous insertions, and by forced extension. The contraction increases, slowly in most cases, but rapidly in some, up to a certain point, when it remains stationary. In five cases in which the biceps was affected, the angle formed by the arm and forearm, when the latter was extended to the utmost, measured 160°, 135°, 135°, 130°, and 90°, respectively. In another case, the ring and little fingers were completely flexed upon the palm of the hand.

Under the name of "chronic syphilitic tetanus," Deville[1] has reported a case in which a large number of muscles were involved, and death ensued from contraction of the muscles of the pharynx, which was impassible to a probang. Notta coincides with Deville in regarding the disease as syphilitic.

In none of Notta's cases had the patients ever suffered from rheumatism, which, therefore, could have had no part in producing the muscular contraction; but all presented unquestionable syphilitic symptoms, which, in three, belonged to the tertiary; in two to the secondary; and in one to both the secondary and tertiary periods. So far, therefore, as it is admissible to judge from so small a range of statistics, it may be concluded that muscular contraction, like syphilitic orchitis, belongs to the period of transition intervening between pure secondary and tertiary manifestations.

The treatment of this affection consists in the combined administration of mercurials and the iodide of potassium. By these means Notta succeeded in effecting a perfect cure in four cases; in a fifth the relief was only partial; and in the sixth treatment had no effect whatever. As is true of other syphilitic symptoms, the disease is likely to return if treatment be suspended too soon.

The pathology of syphilitic contraction of the muscles is obscure.

[1] Bulletin de la Soc. Anatomique, 1845, p. 276.

Virchow ascribes it to "callous degeneration of the muscular tissue; an alteration analogous to that produced by rheumatic inflammation, either simple or traumatic. In the interspaces between the muscular fasciculi, a conjunctive tissue is developed, which hardens and produces atrophy, and finally the destruction, of the primitive muscular fibrils."[1]

MUSCULAR TUMORS.—Our knowledge of syphilitic tumors of the muscles, tendons, and aponeuroses is due in a great measure to the labors of M. Bouisson, late Prof. of Surgery at Montpellier. These tumors consist of the same gummy material which has been described in a previous portion of this work. Indeed we have already referred to deposits of this nature in the muscles when speaking of syphilitic affections of the mouth and air passages; since tubercles of the tongue are frequently seated in the muscular as well as in the cellular tissue; and many of the sloughing ulcers of the velum palati, pharynx and larynx, commence as gummy tumors of the neighboring muscles, the mucous membrane being involved secondarily. Mention has also been made of similar tumors in the lips, which have sometimes been mistaken for epithelial cancer. In addition to the muscles of the regions here mentioned, gummy tumors have been met with in the glutæus maximus, trapezius, sterno-cleido-mastoideus, vastus externus, pectoralis major, and some others; and in the walls of the heart by Ricord,[2] Lebert,[3] and Virchow.[4]

"*Syphilitic tumors of the tendons* appear to depend upon circumscribed hypertrophy of the normal fibrous tissue, together with an effusion of serous and plastic material. They are the seat of more or less pain, which is increased by the action of the corresponding muscle. If the tendon be examined after death, it is found to have preserved its normal color or to be but very slightly injected; but it is swollen either from thickening of its fibres, or the deposition of an albuminous and semi-solid material within its substance. In old cases not terminating in suppuration, ossification may take place and involve the whole extent of the tendon, as in one instance I have met with in the psoas parvus; in other cases it is limited to the part of the tendon first affected, and gives rise to a kind of sesamoid bone.

"Syphilitic tumors of the tendons are sometimes situated near

[1] La Syphilis Constitutionnelle, p. 105.
[2] Iconographie, Pl. XXIX.
[3] Traité d'Anatomie Pathologique, t. i., Pl. LXVIII., Fig. 5.
[4] La Syphilis Constitutionnelle, p. 108.

their surface and sometimes at their centre. The former are the more common. In this case the swelling is more perceptible and forms an abrupt projection in the course of the tendon; and if suppuration takes place, the continuity of the fibrous cord is respected. But the disease may be limited to the central portion, in which case the normal fibres of the tendon are separated by the adventitious deposit, and the tumor assumes an ovoid or fusiform shape."

Of *syphilitic tumors in the muscles* Bouisson says: "It is difficult to determine whether the earliest changes take place in the muscular fibrils or in the intervening cellular tissue; although analogy would lead us to believe that it is the fibro-cellular element connecting the fleshy fibres or serving as their sheath, which is first involved. But in advanced cases—no matter what the mode of termination, whether by suppuration or induration—all the anatomical elements appear to be affected; and, according to the progress of the morbid action, the muscular fibres are either surrounded by a material of new formation or are softened and destroyed, or, again, are transformed into indurated, sub-cartilaginous or even osseous tissue. Such at least are the different stages I have met with in these tumors.

"In the *first stage*, the muscle is the seat of a local and circumscribed swelling, of greater consistency than œdema. Upon a cut surface of the diseased tissue we can recognize decolorized muscular fasciculi in the midst of a plastic effusion of a grayish color.

"In the *second stage*, the adventitious deposit softens, and, if the attendant inflammation continues of a chronic character, is transformed into a viscid, stringy liquid, resembling a solution of gum. If, on the contrary, acute inflammation sets in, or if the tumor has been attended from the outset with constant pain and an increase of temperature, pus is formed in the centre of the muscle, the fibres are softened and destroyed, and more or less disorganization takes place. I suspect that many intra-pelvic abscesses, and many cases of destructive inflammation of the psoas and iliacus muscle are really syphilitic phlegmasiæ of the muscles of this region. I have frequently observed complications of this kind in syphilitic subjects; and I recently called the attention of my students to a patient at the hospital, who was seized with chronic inflammation of the psoas and iliacus muscles on the left side. A tumor of considerable size formed in the pelvis, and pointed near Poupart's ligament. On being opened an enormous quantity of pus escaped. The patient was subjected to specific treatment, and completely recovered.

"In the *third stage*, those syphilitic tumors of the muscles which

do not suppurate, become indurated. Like periostoses, they pass through successive stages of organization, and from being firm, become sub-cartilaginous, cartilaginous, and osseous. This final transformation, from its peculiarity and persistency, has especially attracted the attention of pathologists. I have seen a very remarkable example of it in the museum of the Faculty of Medicine at Strasbourg — an osseous mass of very considerable size developed in the substance of the quadratus femoris. Ossifications of the muscles and their tendons have frequently been observed in syphilitic persons with exostoses on various parts of the body. In the collection of my colleague, Prof. Dubrueil, is the skeleton of an Arab who was affected with syphilis, and in whom, besides numerous exostoses, there was ossification of a large number of muscles at the points of their insertion."[1]

These tumors vary in size from that of a filbert to an orange. They are most easily detected when the muscle is relaxed, and their independence of the subjacent bone can then be best established. They excite little or no pain unless the muscle be put upon the stretch, and their chief inconvenience is due to their interference with motion. They are almost always accompanied by other syphilitic manifestations, as nodes, exostoses, tubercles of the cellular tissue, or ulcerations of the fauces; and their treatment is that of the advanced stages of the disease, viz., by means of the iodide of potassium and tonics, either associated with, or followed by, mercurials.

[1] Bouisson, op. cit.

CHAPTER XVIII.

SYPHILITIC AFFECTIONS OF THE NERVOUS SYSTEM.

AMONG the affections of the nervous system, which, with greater or less probability, have been ascribed to syphilis, are the various forms of paralysis, apoplexy, epilepsy, mental derangement, disorders of sensibility, defective memory and intelligence, and the neuralgias. These affections may proceed —

A. From caries, necrosis, or exostosis of the bones of the head or spinal column, involving the nervous centres, or the nerves themselves secondarily.

B. From lesions of the meninges of the brain and medullary canal; the most frequent of which are gummy tumors springing from the dura mater, and encroaching upon the cerebrum, cerebellum, or spinal marrow.

C. From gummy tumors developed in the substance of the brain, or in the course of the cranial nerves.

D. In some instances, when post-mortem examination reveals no organic lesions to account for the nervous symptoms, but in which it is probable that such previously existed, but have since disappeared either spontaneously, or, more frequently, as the effect of treatment. Ricord[1] reports a case of hemiplegia and mental derangement in a syphilitic subject, at whose post-mortem nothing abnormal was found in the brain or bones of the head, and similar instances are mentioned by other observers.

Syphilitic affections of the nervous system present no pathognomonic symptoms by which their specific character may be recognized; and, except in those instances in which manifest lesions of the bones of the skull, face, or spine, clearly indicate the etiology of the disease, the diagnosis can only be established by the history of the case, the concomitant symptoms, and the effect of treatment.[2]

[1] Iconographie. Pl. XXXIX.

[2] When the reader is informed that M. Lagneau, fils, has written a closely-printed volume of 528 pages, octavo, upon syphilitic affections of the nervous system, he will appreciate the impossibility of my doing justice to this subject within the

The two following cases of syphilitic epilepsy have occurred in my own practice.

CASE 1. Mr. H., æt. 36, applied to me October 22, 1856, for a superficial erosion, with slightly indurated base upon the internal surface of the prepuce, and a pleiad of indurated ganglia in each groin. He was told that he had syphilis, and was immediately put upon the use of mercurials, under which the sore speedily healed, and the glands lost much of their hardness.

Although the mouth was kept tender for several weeks, and treatment was continued until the first of April, yet a papular eruption made its appearance May 21, accompanied by mucous patches on the tonsils, and pustules upon the scalp, and beneath the whiskers. Treatment was again resumed, but as soon as his symptoms had been dissipated, Mr. H. became irregular in taking his medicine, and had another relapse the following August. He now became convinced of the necessity of pursuing treatment faithfully for a long period, and expressed himself willing to follow any directions which I should give him.

I determined to pursue the course recommended by Ricord, and give my patient mercurials for six months, keeping him constantly upon the verge of salivation, and afterwards iodide of potassium in full doses for three months. Mr. H. faithfully obeyed my directions, and maintained his general health and strength to a remarkable degree under the depressing influence of mercurials, which were continued in as full doses as could be borne without producing salivation until the middle of February. The iodide of potassium was now commenced, and gradually increased from fifteen to forty-five grains a day, but was suspended about the middle of April, a month before the appointed time; however, as the mercurial treatment had been pursued so thoroughly, this was regarded as of slight importance.

On May 2d of the same year (1858), only a fortnight after suspending this active course of treatment, Mr. H. again applied to me, complaining of frontal headache, which was not, so far as I could learn, nocturnal in its character, and which I attributed to excessive attention to his business, and late hours. His bowels were also quite costive.

On the evening of May 5th, Mr. H. assisted in putting out a fire at the house of a neighbor, and on the following day, while at his office, was suddenly seized with an epileptic fit, which was followed by five others before night. I saw him in several of them, and

limits of the present work. For farther details, I would refer to the work in question, which comprises all that is now known upon the subject, and includes most of the cases published by various authors.

found that they presented the ordinary characters of epilepsy, viz., loss of consciousness, convulsive action, foaming at the mouth, biting the tongue, etc., followed by stupor for a short period afterwards.

He recovered sufficiently from this attack in three or four days to resume his business, and was feeling quite well again, with the exception of some continuance of the headache, and a tendency to constipation, when on the 28th of the same month he sprained his ankle, which obliged him to keep his bed; and on the following day (29th) he was again seized with epilepsy, and had, as before, six fits before night. He did not recover from this as from his previous attack, but was left in an exceedingly excited, and, at times, almost maniacal condition. For a few moments he would converse rationally and connectedly, and then suddenly cry out at the top of his voice, and talk in the most incoherent manner; his memory also left him in a great measure, and, at times, he did not appear to recognize his friends around him. It should be here stated that Mr. H. was a man of abstemious habits, and, although of a naturally nervous temperament, had never before suffered from any cerebral affection.

The question now arose in my mind whether his symptoms were due to his syphilitic taint, but was answered in the negative, on the ground that he had but just completed so thorough a course of anti-syphilitic treatment; and I feared in his present condition to resort again to mercurials. I, therefore, directed him to be kept quiet and away from business, and to take a daily ride in a carriage; introduced a seton in the back of his neck; and prescribed valerianate of zinc, combined with extract of hyoscyamus internally, together with cathartics, when required. This treatment, however, had but little effect; the seton gave him so much annoyance, and appeared to increase his irritability to such a degree, that I was compelled to withdraw it; his fits did not return, although he was several times threatened with them; but his almost insane condition continued with but little amelioration until June 17th, when I sent him into the country for a change of air and scene. Here he somewhat improved, although almost imperceptibly; he was still troubled with headache, and was at times very excitable.

About the middle of August, an eruption of syphilitic psoriasis appeared upon his legs and body, and led me at once to doubt the correctness of my previous conclusion as to the nature of his complaint, and to regard it as syphilitic. I immediately commenced the use of protiodide of mercury and iodide of potassium, under which the improvement in his cerebral symptoms was as gratifying as it was astonishing, and my patient returned to his business before the end of August, with his mental faculties completely restored.

Since that time he has been actively engaged in his profession, and

constantly in good health, except on two occasions, when he has had a slight return of his syphilitic eruption, which is always preceded by mental depression and nervous excitability. Mercury acts like a charm under these circumstances, dissipates the eruption, and restores his health and spirits.

This case is, in many respects, a very peculiar one. The decided benefit which has always been derived from mercurials, and yet the frequent relapses which have taken place, are quite unusual. Various preparations of mercury, and different modes of its administration, among others mercurial fumigation, have been tried without affording permanent relief. The pathology of the nervous affection is also obscure, since the symptoms have always been those of the secondary stage of syphilis, and not such as would indicate lesions of the fibrous and osseous tissues. The facility with which they have yielded to remedies would lead one to suspect effusion within the ventricles, or at the base of the brain. It should be remarked that the urine has been repeatedly examined and found to be normal; and there has been no evidence of disease in the kidneys or other organs.

Case 2. Mr. W., æt. 38, a gentleman by birth, and a man of fine constitution, but sadly addicted to drink, applied to me June 14, 1860, for an erythematous eruption upon the abdomen, and mucous patches upon the tongue, the result of contagion three months before. He still bore an indurated mass in the site of the chancre in the furrow at the base of the glans, and the inguinal glands were also indurated. The eruption disappeared within a fortnight under the use of the protiodide of mercury, and I urged him to continue treatment for some time longer. This he promised to do, but I lost sight of him, and afterwards learned that he gave up taking his medicine within a few days after his last visit.

I next saw him at his house, October 14th, after he had been on a debauch for three weeks, during which time he had not been home, and had slept in a bar-room. He was now one of the most disgusting and yet pitiable objects I ever saw. His hair, which was naturally black when I last saw him, had turned to an iron gray; his head was covered with a pustulo-crustaceous eruption, arranged in circles, or segments of circles; there was a large patch of the same eruption over the sternum; the post-cervical glands were very much engorged; the internal surface of his lower lip was covered with opaline patches, and his voice indicated ulceration of the fauces; the palms of his hands presented copper-colored rings of elevated and scaly integument; all of his finger nails without exception were ulcerated around their bases; and the buttocks and upper and inner portions of his thighs were profusely scattered over with condy-

lomata, the secretion from which filled the room with its offensive odor.

During this and the two following days, my patient had six or eight epileptiform seizures, characterized by loss of consciousness, convulsive action and foaming at the mouth; in the intervals of which he was perfectly rational, and exhibited no more nervous agitation than is commonly observed after a debauch.

The treatment adopted consisted in mercurial inunction externally, and the internal administration of quinine and sedatives, together with a nourishing diet; and by the first of December, Mr. W. left for the South, entirely relieved of his syphilitic symptoms.

Since the publication of the first edition of this work I have met with several other cases of epileptiform convulsions, and a number of instances of paraplegia and hemiplegia, in syphilitic subjects, and apparently dependent upon the constitutional taint, since more or less complete recovery has taken place under the use of specific remedies.

CHAPTER XIX.

SYPHILITIC AFFECTIONS OF THE PERIOSTEUM AND BONES.

THESE affections are among the latest manifestations of the syphilitic diathesis, and may be regarded as types of tertiary syphilis. They do not necessarily occur in every case of syphilis, even if left to itself without treatment; since the disease generally wears itself out before arriving at the tertiary period. The idea, which is sometimes advanced, that these affections are due to mercury, even when judiciously employed, is entirely without foundation. This mineral is generally necessary in conjunction with the iodide of potassium to effect their permanent removal, and can never favor the evolution of tertiary syphilis, unless pushed to the detriment of the general health.

In the time of their development tertiary follow secondary lesions, or coincide with the later forms of the latter. The absolute interval which has elapsed since contagion, at the time of their appearance, varies very much in different cases, and chiefly depends upon individual peculiarities, the mode of life of the patient, and the treatment to which he has been subjected. It often amounts to many years, and, according to Ricord's rule, which is undoubtedly correct, is rarely, if ever, less than six months.

We meet with some instances in which syphilis appears to skip over its secondary, and manifest itself only in its primary and tertiary forms. A man has a chancre, and after several years of apparent health is attacked with tertiary symptoms, as, for instance, osteocopic pains, ostitis, or tubercles of the deep cellular tissue. In such cases, either the patient was subjected to mercurial treatment for his primary sore, which has prevented secondary, but has not been sufficient to avert tertiary manifestations; or he has had secondary symptoms of so slight a character as not to attract attention. As I have shown at length in a previous chapter, the general symptoms of syphilis, in the absence of specific treatment, always appear within six, and generally within three months after infection.

In many cases the morbid processes which syphilis sets up in the periosteum and bones, appear to be the same as those induced by other causes. Thus, we find inflammation of the periosteum and of the subjacent layer of bone, terminating in an effusion of sero-albuminous or purulent matter—in other words, forming an abscess, which finally opens externally through thinning and ulceration of the integument. In like manner, syphilis often gives rise to ostitis, terminating in suppuration, caries, and necrosis, which cannot be distinguished from the effects of non-specific causes of inflammation. In many instances, however, syphilitic affections of these tissues exhibit the same marked tendency to the effusion of plastic material, which has been noticed when speaking of tertiary ulcerations of the air passages. Thus the adventitious deposit of nodes is often transformed into true bony tissue (epiphysary exostoses); and syphilitic ostitis frequently gives rise to outgrowths springing from the bone itself (parenchymatous exostosis); or it may result in general hypertrophy (hyperostosis). Again, when attacking the periosteum and bones, syphilis sometimes causes a deposition of the same material, known as syphilitic tubercle, which is found in the gummata of other regions. Whether these various changes are to be regarded as distinct, or as stages of one and the same process, cannot, in the present state of our knowledge, be fully determined.

Osteocopic Pains.—The pains in the bones, belonging to tertiary syphilis, differ from those observed in connection with early secondary symptoms, in being confined to certain regions, and in not changing their locality like the latter. Their favorite seat is in those bones which approach nearest the surface, as the tibia, ulna, clavicle, sternum, and cranium; but no portion of the skeleton is exempt from them. In most cases they are increased, but in others are uninfluenced by pressure. A striking peculiarity of these pains is their marked nocturnal character. They are generally absent or are scarcely felt during the day, but return at night with great severity after the patient retires to bed, and only abate towards morning. This nocturnal exacerbation is attributed to the warmth of the bedclothes by Ricord, who states that in bakers, who are obliged by their occupation to turn day into night, the pains are chiefly diurnal. This explanation, however, does not appear to hold good in all cases, for in some they return at a certain hour in the evening, whether the patient has or has not retired; and, in a few instances, they are equally as severe during the day as at night. In most cases tertiary osteocopic pains are merely

symptomatic of commencing changes in the periosteum or bones, which, in the absence of appropriate treatment, are usually manifested within a few months. In other instances, however, they persist for a long period without the appearance of any appreciable organic lesion; although, even then, it may be questioned whether the deeper portions of the bones, or the lining membrane of the medullary canal, be not affected.

Osteocopic pains yield with great facility to the internal administration of iodide of potassium, but are very prone to relapse. In most cases, their permanent removal can only be effected by careful attention to the general health and the judicious employment of mercurials. Patients have frequently been under my care, who for years have been obliged to resort to iodide of potassium every few months for the relief of tertiary pains, which have ceased to return after a mercurial course, administered either by the mouth, by fumigation, or inunction. Mercurial inunction and fumigation are especially adapted to these cases.

NODES.—In the formation of nodes, inflammation of the superficial portion of the subjacent bone, as well as of the periosteum itself, doubtless has a share; although the adventitious deposit which constitutes the swelling is chiefly effused from the latter tissue. These tumors exhibit a preference for those regions already mentioned as the favorite seat of osteocopic pains. They are most frequent upon the internal surface of the tibia and upon the bones of the head; but are also seen upon the clavicle, sternum, ribs, radius, ulna, etc., and similar changes may take place beneath the lining membrane of the medullary canal in the long bones, and between the dura mater and the bones of the skull.

When seated upon the superficial bones, nodes appear as ill-defined tumors, adherent to the osseous tissue beneath, generally tender upon pressure, giving rise to severe nocturnal pain, and unattended, at least at their commencement, by redness of the integument, which is movable over them, and only becomes involved, if at all, in the subsequent progress of the tumor. If an opportunity be offered to examine their internal structure, the periosteum is found to be injected and thickened by infiltration into its substance, and elevated above the bone by an effusion of fluid. In some cases, the effusion consists of pus, which after a time finds exit through ulceration of the integument and exposes the bone, which often becomes carious or exfoliates.

In other instances, the effusion consists of a yellowish, gelatinous

fluid, containing an abundance of fat-corpuscles as seen under the microscope, and inclosed in a loose network of cellular tissue. This variety, which generally undergoes resolution, resembles the gummy deposits which take place in the cellular tissue, in the muscles and many of the viscera, and has been denominated "gummy periostosis." Ricord[1] has reported and figured a case of periostosis upon the internal surface of the tibia, in which there was a deposit of gummy material in the corresponding portion of the medullary cavity of the bone and in the substance of the neighboring tibialis posticus muscle, together with simple hypertrophy of this part of the shaft of the tibia.

In a third variety, which is the most common, the tumor is hard and firm; the nocturnal pain is especially severe; and the contained fluid, which is of a plastic character, acquires greater consistency and often gives rise to an exostosis, at first separated from the bone by cartilaginous tissue, which finally undergoes ossification.

These *epiphysary exostoses*, as they are called, are generally of small size, sometimes thin and flat, and sometimes hemispherical or pedunculated. "At an early period of their existence, they consist of cellular tissue, containing a well-developed network of vessels. They acquire greater consistency with time, and finally present an eburnated texture. Arrived at this point, resolution is no longer possible; the tumor remains stationary, and treatment has no other effect than to quiet the osteocopic pains. If resolution be attained at an earlier period, their surface, which before was smooth, becomes irregular, indicating partial absorption. Sometimes this absorption continues after the whole of the tumor has disappeared, so that local atrophy of the bone succeeds the exostosis."[2] In other instances, syphilitic exostosis is not preceded by periostosis, but is the result of ostitis terminating in hypertrophy of the normal bony tissue, in which case it is denominated *parenchymatous exostosis*.

An exostosis situated externally rarely occasions sufficient inconvenience or deformity to necessitate its removal by an operation unless under peculiar circumstances, as was the case with a violinist from whose metacarpal bone a tumor of this nature, which had interfered with the exercise of his profession, was removed by Ricord.

But exostoses may also spring from the internal surface of the cranial bones and give rise to symptoms of the most serious charac-

[1] Iconographie, Pl. XXVIII. bis.

[2] NÉLATON, Pathologie Chirurgicale, t ii., p. 16.

ter, as convulsions and the various forms of paralysis. The frontal bone is by far the most frequently affected in this manner. Lagneau, in his able work[1] upon Syphilitic Affections of the Nervous System, has been able to collect but three cases of exostosis springing from the parietal, and one from the sphenoid bone; he appears to have met with none in the occipital or temporal. These intra-cranial exostoses vary very much in size. Saltzman[2] reports a case in which the tumor occupied the internal surface of one of the parietal bones commencing at two fingers' breadth from the sagittal suture and extending to the coronal suture in front and the temporal below; the patient died with symptoms of apoplexy. Within the cranium[3] of Clermont-Ferrand, deposited in the Dupuytren Museum, are two exostoses, one of which is as large as an orange. In general, however, these tumors are much smaller, and often multiple. They also vary in density, some presenting a hard, eburnated texture, while others are cellular. Most of them spring directly from the surface of the bone (parenchymatous exostoses); indeed, the existence of epiphysary exostoses within the cranium has been denied, but Vidal[4] gives a representation of a specimen in the Dupuytren Museum, in which the tumor is separated from the normal tissue by a distinct line of demarcation.

Syphilitic exostosis of the vertebræ, either external or within the spinal canal, is rare; but Lagneau[5] has adduced several instances reported by Cloquet and Bérard, Godelier, Piorry, and Minich.

The treatment above recommended for osteocopic pains is equally applicable to nodes, which generally yield with great facility to iodide of potassium; although a subsequent course of mercury is necessary to secure immunity for the future. The best local treatment is the one so highly extolled by Ricord, consisting in the repeated application of blisters which may be dressed with an ointment containing morphine or powdered opium. As a general rule, the swelling should not be opened, even if fluctuation be evident, since resolution may almost always be obtained by the means indicated, and exposure of the bone is frequently followed by caries or necrosis of its superficial layer.

[1] Maladies Syphilitiques du Système Nerveux, par GUSTAVE LAGNEAU, FILS. Paris, 1860, p. 45.

[2] Acta Phys. Med. Academiæ Ces.-Leop. Carol. Naturæ Curiosorum Ephemerides, Norimbergæ, 1730, t. ii., p. 222, obs. 99 (as quoted by Lagneau, fils, op. cit., p. 361).

[3] Figured by VIDAL, Pathologie Externe, 2e édition, t. iii., p. 111, 1846.

[4] Op. cit., t. iii., p. 116.

[5] Op. cit., p. 193.

CARIES AND NECROSIS.—Syphilitic caries and necrosis may arise—

A. From ulceration of the soft parts in the neighborhood of the affected portions of bone. The ulcerative process involves the periosteum or perichondrium, and the bone or cartilage, deprived of its vascular supply, loses its vitality. This is the usual mode of origin of caries and necrosis of the hard palate, the bones of the nose, and the thyroid cartilage; more rarely the superficial bones, as the clavicle, sternum, cranium, and the internal surface of the tibia, are similarly affected consecutively to ulceration of the integument.

B. From the suppuration and opening of nodes, whereby the bone is laid bare, and its vascular supply cut off.

C. From suppurative inflammation of the osseous tissue independently of any affection of external parts.

Caries and necrosis are not confined to any portion of the skeleton, but are most frequent in the superficial bones. Although they generally attack the shafts of the long bones, yet they occasionally involve the neighborhood of the joints, where they cannot be distinguished from the effects of scrofula except by the history of the case and the concomitant symptoms.

Inflammation of the cranial bones resulting in caries and necrosis usually commences in the external, but sometimes in the internal table, and attacks the frontal far more frequently than either of the others. More or less of one of the tables may exfoliate, leaving the diploe and opposite layer intact. In a case observed by Dupuytren,[1] two-thirds of the internal table of the skull were necrosed; and in another, reported by Pétrequin,[2] the whole external table of the frontal bone exfoliated. More frequently, although the external table is involved to the greater extent, the diploe and internal table are perforated at one or more points, laying bare the dura mater, which, when the opening is large, may protrude externally, either preserving its normal character, or assuming a highly vascular and fungous appearance.

When the disease commences in the internal table of the skull, the inflammatory products and portions of necrosed bone sometimes find exit through perforation of the external parts; or, in other instances, accumulate between the bone and dura mater, cause compression of the brain, or give rise to encephalo-meningitis and disorganization of the cerebral substance. Moreover, in nearly every case of syphilitic disease of the cranial bones, the dura mater,

[1] Clinique de l'Hôtel Dieu; Transactions Médicales, par MM. Forget et Sandras, Paris, 1832, t. x., p. 269 (quoted by Lagneau, op. cit., p. 403).

[2] Gaz. Méd. de Paris, 1836, t. iv., p. 643.

upon its internal or cerebral aspect, presents thin layers of fibrinous or hemorrhagic deposit, which are easily detached from the surface.[1]

Virchow[2] states that necrosis produced by syphilis may be distinguished from that due to other causes by the sequestrum, which is perforated with large holes and presents a worm-eaten appearance. "In syphilitic necrosis, the surface of the sequestrum is pierced with large holes, which unite internally and lead to the suspicion that they have been due to a deposition of gummy material; the surrounding tissue, whether necrosed or not, is often dense and eburnated, presenting a strong contrast to the above."

The same author[3] has described among the syphilitic affections of the bones a form of caries without suppuration, to which he gives the name of "dry caries," or "inflammatory atrophy of the cortical substance of the bone," and which he believes is due to the compression exercised by deposits of gummy material.

Extreme fragility of the bones has often been noticed in persons affected with tertiary syphilis. A patient who was under my care a few years since for syphilitic necrosis of the bones of the head, fractured his thigh while simply turning in bed. Death ensued from exhaustion in the course of a few weeks, but no opportunity was offered for a post-mortem examination.

It is unnecessary to repeat the directions already given for the constitutional treatment of tertiary syphilis, which includes that of syphilitic affections of the bones. In commencing ostitis, valuable assistance may be derived from the local application of blisters, which, as recommended by Ricord, may be dressed with mercurial ointment.

"When suppuration or caries occurs, especially of the bones of the face which are so often necrosed in these cases, we should never fail to remove them as soon as they can be separated from the sound parts. We must recollect that caries engenders caries; that when the organic tissue of a bone has been destroyed by suppuration or has lost its vitality, it cannot be regenerated by any constitutional or local treatment whatsoever; and that its *débris* should never be left to spontaneous evolution, since they are foreign bodies, maintaining and extending suppuration, which, by involving important parts, may occasion the most serious symptoms, or even result in death."[4]

[1] VIRCHOW, Syphilis Constitutionnelle, p. 50.

[2] Op. cit., p. 49.

[3] Op. cit., p. 37.

[4] RICORD, Notes to Hunter, 2d Am. ed., 1859, p. 507.

CHAPTER XX.

CONGENITAL SYPHILIS.

SYPHILIS acquired during intra-uterine life is variously designated as congenital, hereditary, or infantile. The first of these terms appears to me the most appropriate, since it includes those cases in which the disease is derived from one or both parents at the time of conception, and also those in which it is communicated to the fœtus through the mother during gestation; while it excludes those instances in which it is contracted during or after delivery, and in which syphilis pursues essentially the same course as in adults.

ETIOLOGY.—Congenital syphilis may be derived from both parents; from the mother alone; from the father alone. In either case it is not necessary that the parent or parents, in whom the disease originates, should present syphilitic manifestations; the existence of syphilitic intoxication is alone sufficient, and numerous cases have been reported of persons in whom the disease has been latent for many years, and who have yet had syphilitic children.

When both parents are tainted with syphilis, and provided they have not been subjected to general treatment, the disease is almost certain to appear in their offspring. When one or both parents have received appropriate treatment, or when only one is affected with syphilis, the child may yet be born healthy.

When the fœtus is infected through the mother alone, the latter may have contracted the disease either before or after impregnation

Syphilis contracted by the mother prior to conception is sufficient to give rise to the disease in a child by a perfectly healthy father. Thus, a widow who has been infected by her first husband, may marry a healthy man and give birth to syphilitic children; or a woman who has contracted the disease by nursing a syphilitic infant, may be delivered of tainted offspring whose father is unaffected.

An infant may also be born syphilitic in consequence of disease

contracted by the mother subsequent to conception. Numerous instances of this kind are reported, and I have already mentioned one occurring in my own practice, in which the disease was communicated by a husband to his wife as late as the end of the fifth month of gestation.[1] It is generally admitted, however, that the danger to the fœtus is much less during the latter months of pregnancy than at an earlier period; and Diday[2] concludes, from an analysis of eleven cases, that syphilis contracted by the mother after the completion of the seventh month has never produced the disease in the fœtus. As suggested by the same author, if this fact should be confirmed by farther observation, it would prove of considerable practical importance, in enabling us, when syphilis is contracted by a woman during the eighth or ninth month of pregnancy, to dispense with mercurial treatment until after delivery; and also to intrust a child born under these circumstances to a wet nurse without danger of infection to the latter.

Again, syphilis in the father may occasion the same disease in the fœtus without previous infection of the mother. In most cases of hereditary syphilis, primarily due to disease in the father, we find that the mother has also been infected either before or during gestation; but a number of instances have been reported in which the latter has continued perfectly healthy for a long period after delivery, and in which the disease in the offspring must have been derived from the former alone. For a father to transmit syphilis to his child, it is not necessary that he should present upon his person, at the time of impregnation, the slightest syphilitic manifestation. He may have recently contracted a chancre, and be passing through the period of incubation of secondary symptoms; or the disease may apparently have been subdued by treatment, and many years have subsequently been passed in health. The existence of the poison, even if it be latent, either in the father or mother, *may* engender syphilis in the offspring.

It has been supposed by some authors, if a man affected with syphilis has connection with a pregnant woman, that his semen may be absorbed, and conveyed directly to the fœtus causing its infection, without communicating the disease to the mother. So extraordinary an occurrence cannot be admitted unless sustained by indubitable evidence; and I am, therefore, surprised that it is regarded with favor by Diday, especially as he has been able to adduce but one exceedingly lame fact, reported by Albers, in its support. The

[1] See page 405.

[2] De la Syphilis des Nouveau-nés, p. 48.

analogy drawn by Diday and Lawrence from the occurrence of smallpox in the fœtus, while the mother remains exempt, is very far from conclusive, since the poison of variola is volatile, and is readily absorbed through the sound mucous membrane of the respiratory organs; whereas the syphilitic virus is communicated only by contact, and never, so far as we know, without causing ulceration at its point of entrance. Evidently, the transmission of disease, and of mental and physical characteristics, from the father to the ovum, at the time of impregnation, does not warrant our assuming, in the entire absence of evidence, the improbable supposition that the same may be communicated to the fœtus, at any period of gestation, by a man who has connection with the mother. If this were so, the proof of paternity would, in many cases, be of an extremely doubtful character.

Although syphilis acquired after leaving the womb of the mother is not properly included under the head of congenital or hereditary syphilis, yet a few remarks upon this subject will not be out of place at the present time. After its exit from the uterus, the infant is evidently exposed to the same sources of contagion as adults, with the exception of voluntary sexual congress. In its passage into the external world, its cutaneous surface is very thoroughly protected by a sebaceous coating which commonly prevents inoculation from any syphilitic lesion upon the genital organs of the mother; and although contagion in this manner is by no means impossible, or even improbable, yet, according to Diday, no unquestionable instance has ever been reported.

At a subsequent period, infants most frequently contract syphilis from wet-nurses, themselves affected with the disease, who bear either a primary or secondary lesion upon the breast. In most cases of contagion from a nurse to a nursling, the sore upon the breast of the former is a chancre, accompanied by induration of the axillary ganglia, and originally derived from a mucous patch upon the mouth of some child, whom she has previously nursed; in other cases, the secretion of a secondary lesion is the source of contagion. The reader is referred to page 459 of the present work for a fuller account of the phenomena of secondary contagion.

Although it is not improbable that the milk may have some influence in the transmission of syphilis to infants at the breast, yet no conclusive facts have hitherto been reported by which this method of contagion can be established beyond a doubt.

TRANSMISSIBILITY.—We have seen that an ovum, healthy at the

time of conception, may become infected during the greater portion of the period of gestation in consequence of the mother contracting syphilis. This influence, as existing between mother and child, is mutual; and a fœtus contaminated with syphilis by its father may communicate the same disease to a mother, who was unaffected at the time of impregnation. Infection of a mother through the medium of a fœtus was, according to Mr. Hutchinson, first noticed by Gardien (*Traité des Accouchements*) in 1824, and is admitted by most recent writers upon venereal, among whom may be mentioned Ricord, Diday, Depaul, Acton, Harvey, Tyler Smith, and Balfour; it is by no means, however, to be regarded as a necessary consequence of the contamination of the ovum by a diseased father; and, as in thirteen cases reported by Victor De Méric,[1] a mother may give birth to a syphilitic child, and yet never present the slightest evidence that she herself is affected. The contagiousness of secondary lesions, which is now established beyond question, will probably explain many cases in which a wife becomes infected in the absence of a primary sore in her husband, and which have hitherto been considered, especially by the advocates of Ricord's earlier views, as instances of the communication of the disease through the fœtus.

In consequence of the frequency of mucous patches upon the buccal mucous membrane and the intimate contact between the mouth and breast in the act of nursing, instances of the communication of secondary syphilis by an infant affected with hereditary syphilis are far more numerous than those by adults. In France, where children are often sent to a wet-nurse in the rural districts, syphilis is thus not unfrequently conveyed to villages where it was previously unknown, and, spreading from one person to another, finally affects a large number of individuals. The frequency of instances of this kind induced Diday, in his able work upon Infantile Syphilis, to admit that hereditary syphilis possesses a peculiar virulence and powers of contagion greater than those of acquired syphilis; a distinction which he has abandoned since the contagiousness of secondary manifestations in general has been conclusively demonstrated.

To the liability of contagion from the lesions of hereditary syphilis, there is an important exception which first attracted the attention of the acute mind of Abraham Colles, of Dublin; it is this, that although the disease is frequently communicated by an infant to a wet-nurse, yet a mother has never been known to be infected from

[1] Lettsomian Lectures, p. 65.

nursing her own offspring. This fact, singular as it may at first appear, is, in most cases, susceptible of ready explanation; it is, indeed, merely an exemplification of the "unicité" of the syphilitic diathesis; for whenever the mother has already been contaminated, either directly by the father or indirectly through the fœtus *in utero*, she is thereby protected from a second infection; and even when she presents no evidence of a syphilitic taint, she must have been exposed to it during gestation, and her immunity is to be ascribed to a constitutional inaptitude to contract the disease; in other words, the mother has undergone before delivery the greatest amount of exposure to which the fœtus can subject her, and which, if capable of infecting her system at all, has already done so before the birth of the child.

ABORTION.—Syphilis is so frequent a cause of the premature expulsion of the fœtus, that repeated abortions form a valuable element of diagnosis in the investigation of suspected cases of this disease in married life. It has sometimes been supposed that the cause of the abortion in these cases was not the syphilitic taint, but the mercurial treatment to which the mother was subjected. This opinion, however, is erroneous. The careful administration of mercury to a pregnant woman affected with syphilis affords the surest protection to her child; and it is very rare for this mineral to produce abortion unless given injudiciously and in such a manner as to irritate the stomach or intestines.

When both parents are affected with syphilis at the time of conception, and the mother does not receive appropriate treatment in the early months of pregnancy, the fœtus will rarely be carried to the full term of gestation. When only one parent is affected, it is reasonable to suppose, with Diday, that the influence of the mother, from whom the fœtus derives its nutrition, will be greater than that of the father; although the contrary is maintained by Prieur, Lloyd, Wade, and Maisonneuve and Montanier.

In most cases of abortion from syphilis the general health of the mother is in a very fair condition, so that the death and expulsion of the fœtus cannot be ascribed to a deficient supply of nourishment. In many cases it is sufficiently accounted for by the changes which are found upon post-mortem examination to have taken place in the thymus gland, lungs, and liver, and which will hereafter engage our attention. The researches of Dr. Robert Barnes have led him to believe that in some instances the immediate cause of the abortion consists in fatty degeneration of the maternal and fœtal

structures of the placenta, the result of defective nutrition. "In a placenta affected with fatty degeneration, the lobes of the placenta are altered in appearance, some of them being of a yellow, fatty color, brittle, and exsanguine; the rest presenting their ordinary characters. Examined more minutely, the tufts are found to be glistening, hard, and tallowy, and not expanding when placed under water, as is the case with the villi of healthy placentæ. Under the microscope, the villi are found to be studded with spherules and droplets of fatty matter and oil. The fatty material is found principally in the cells of the villi, and in the coats of the bloodvessels of the villi. When the fatty degeneration of the vessels exists to any extent, the vessels do not carry red globules. The villi and the vascular loops affected with degeneration are knobbed and misshapen in appearance."[1] Abortion from syphilis is most frequent about the sixth month of gestation, but is by no means confined to this period. Ricord states his impression that abortion takes place earlier when the germ of the disease has been derived from the father alone.[2]

PERIOD OF DEVELOPMENT.—In most cases, an infant affected with congenital syphilis does not present at birth any of the ordinary manifestations of the disease as they are commonly met with in the subjects of acquired syphilis, but is in an apparently healthy or even robust condition; and when any traces of the inherited taint are manifest at this time, they usually consist of an eruption of pemphigus, or of lesions of the internal organs, rarely met with in adults. But although this is the general, it is by no means an invariable rule. Sir Astley Cooper has observed several cases of a copper-colored eruption upon the palms of the hands, soles of the feet, and buttocks, at birth; Gilbert one of flat brownish-red pustules (condylomata) scattered over the back, buttocks, and thighs, and another of a similar eruption around the nates, both infants living but a few days; Guerard one of "tawny-colored spots which every one would recognize as syphilitic;" Landman one of copper-colored stains upon the body and condylomata upon the labia majora. Simon has reported the case of a woman affected with syphilis who repeatedly aborted about the seventh or eighth month, and in each instance the fœtus, which was born dead, bore evident traces of syphilis; Deville one of numerous and well-marked mucous patches

[1] TYLER SMITH, London Lancet, Am. ed., July, 1856, p. 4.

[2] Discussion before the Soc. de Chirurgie, Session of May 31, 1854; Gaz. des Hôp., 1854, p. 296.

upon different parts of the body; and Bouchut one of an infant, born at seven and a half months, who presented mucous patches and pustules of a brownish-red or copper-color upon the legs and arms, together with ulceration of the labia minora and onyxis upon all the fingers and toes. Cullerier, in ten years' service at the Hôpital de Lourcine, Paris, met with only two cases of syphilitic eruptions at birth, one of roseola and the other of mucous patches about the anus.[1] Victor de Méric states that out of forty-six cases of hereditary syphilis which have been under his care, and in which the children were born alive, in only two did the infants present at birth distinct symptoms of syphilis. We conclude that, with the exception of an eruption of pemphigus and specific changes in the viscera, syphilitic lesions manifest at birth, although sometimes met with, are quite infrequent.

In the very great majority of cases, the symptoms of congenital syphilis make their appearance within the first few months after birth; and this fact is of great importance, since, when the parents are the subjects of syphilis, and manifest anxiety as to the future of their offspring, exemption during the period referred to renders it highly probable that the child has escaped contamination. Of 158 cases collected by Diday from various sources, the disease showed itself—

Before the completion of one month after birth in	86
Before the completion of two months in	45
Before the completion of three months in	15
At four months in	7
At five months in	1
At six months in	1
At eight months in	1
At one year in	1
At two years in	1

It appears from this table that the greater proportion of outbreaks of syphilis in tainted infants occur within the first three months after birth; and that when this period is passed in safety, there is not much probability that any symptoms of the kind will manifest themselves.[2]

Other authors have arrived at similar conclusions. Trousseau states that, as a general rule, congenital syphilis appears within the first month; sometimes during the second, third, or fourth; rarely as late as the fifth: and that he has met with but one instance as

[1] Emile Vidal, De la Syphilis Congénitale, Thèse, Paris, 1860, p. 8.
[2] Diday, op. cit.

late as the seventh month.[1] According to Cullerier, it is rare for infants affected with hereditary syphilis to pass six months without the disease appearing; he has, however, witnessed its development in the eighth, ninth, and tenth month, but never after a year from birth.

So far as known facts enable us to judge, Diday concludes that there is no relation between the period of development, the character and progress of congenital syphilis, and its particular mode of origin; in other words, that the evolution and nature of the symptoms will be essentially the same, whether the infant has derived the germ of the disease at the time of conception or during pregnancy.

Late Development of Congenital Syphilis.—We have seen that congenital syphilis almost invariably shows itself within a year, and, in the immense majority of cases, within three months after birth, and that the exceptional cases thus far mentioned do not greatly exceed the former limit. But an important question here arises, viz., whether the period of its latency may be indefinitely prolonged, and a child carry the germ of the disease undeveloped in its system until puberty or even adult life before it betrays itself by external manifestations? The solution of this question is surrounded by many difficulties, since it requires that the syphilitic nature of the symptoms, the absence of direct contagion, and the previous infection of the parents should be clearly established. Many of the facts reported fail to satisfy these conditions; yet others render an answer in the affirmative highly probable. Diday quotes the following cases:—

A washerwoman of Orleans, of bad constitution, but tolerably healthy up to that period, married in 1824. She was delivered at the full time of a male child, which wasted rapidly, and sank on the seventeenth day, with small white pimples around the nails. At the end of a year she had a second child, now more than two years old, and healthy.

A short time after having weaned it, she observed three swellings develop themselves upon her own body, one on the left clavicle, the second at the inner edge of the right sterno-cleido-mastoideus muscle, and the third near the elbow on the same side. The first soon suppurated, and the orifice was converted into a large ulceration.

This woman, when the disease had existed five months, came into the hospital. At the spot indicated, an ulcer with red, abrupt edges, and a grayish base, was observed. She had, farther, a painful node on the left tibia. No trace of primary venereal affection could be

[1] Union Médicale, 1857, p. 182.

discovered on the genital organs of this women. She asserted that she had never had connection with any one but her husband, who, by his own account, had never had syphilis before marriage, and had always been healthy since. But she knew that her father had several times communicated the venereal disease to her mother, and that the latter had been suffering from it when she herself was born. Mercurial treatment rapidly effected the cure of the ulcer.[1]

We find also in Rosen the case of a young girl of eleven, fresh as a rose, in whom hereditary syphilis manifested itself in the form of swelling and suppuration of the glands of the neck and of the nose, of caries of the palate, and of corroding ulcers of the face.[2]

The work of Cazenave[3] on syphilitic affections contains two cases of disease called by him hereditary syphilis, occurring in two girls, one of nine years old, the other of eighteen, in the latter of whom the symptoms had first shown themselves at the age of ten. They had tubercular and serpiginous eruptions, which had produced serious effects. It was impossible to discover any trace of primary lesions, the existence of which was, moreover, rendered very improbable by the age at which the secondary phenomena had appeared. The first was cured by the administration of the protiodide of mercury.

Trousseau has related the history of a young girl of nineteen, in whom he himself observed, in 1826, a chancre (?) in the posterior part of the throat. She had had, at six years of age, exostoses on the legs, and during the six following years nocturnal pains, which did not cease until the appearance of the menses, and afterwards returned. There was probably, says Trousseau, hereditary or acquired syphilis at the moment of her birth. These symptoms were cured by anti-syphilitic treatment.

Sperino[4] saw a child born of a mother who died of syphilis; this child, previously healthy, though puny and scrofulous, was attacked by ulceration of the palate at the age of eleven years. Treated only with antiphlogistic and anti-scrofulous remedies, the ulcer continued to extend, and, after having destroyed the soft palate, it perforated the hard palate. These changes had required two years for their completion. When Sperino saw this child, at the age of thirteen, it was pale, emaciated, had purulent expectoration, almost incessant cough and fever, with evening exacerbations. He believed at first in the existence of pulmonary tubercles, but auscultation showed that none existed. The syphilitic character of the lesion having been diagnosed, syphilization was commenced. But in spite of the evident amelioration which ensued, fresh ulcers having appeared in the

[1] Gibert, Journ. Univ. des Sciences Méd., t. lv., p. 100.
[2] Maladies des Enfants, p. 843.
[3] Traité des Syphilides, p. 542.
[4] La Sifilizzazione Studiata qual Mezzo, etc., 1853, p. 454.

throat after four months of this treatment, recourse was had to iodide of potassium, which, given to the extent of 630 grains, completed the cure.

Ricord does not hesitate to admit the late development of congenital syphilis, which he would attribute to the effect of treatment administered to the mother during pregnancy; and he inquires, with much plausibility, why specific remedies, which are capable of retarding the evolution of general symptoms in the adult, may not similarly affect the fœtus *in utero*.[1] Fournier[2] gives a brief summary of two cases, occurring in patients aged eighteen and twenty-five, who presented nearly the same symptoms, viz., a gummy tumor of the velum palati and an ulcerated tubercle on the posterior wall of the pharynx, which, in the absence of any evidence of direct contagion, were ascribed by Ricord to hereditary taint; and the latter surgeon states that he has "seen subjects in whom hereditary syphilis did not manifest itself before the age of forty."[3]

In this connection I would refer the reader to Mr. Hutchinson's views of the syphilitic nature of "strumous keratitis," so called, and notching of the permanent incisor teeth, already mentioned in the chapter upon syphilitic affections of the eyes.[4]

SYMPTOMS.—Many of the symptoms of congenital are identical with those of acquired syphilis, and do not require special description at this time; I shall, therefore, dwell chiefly upon those which are peculiar to the subjects of an inherited taint.

General Aspect of Syphilitic Infants.—Infants affected with congenital syphilis do not, as a general rule, present any peculiarity of appearance at birth, but, soon after the evolution of general symptoms, they almost always waste away and assume a withered aspect similar to that observed in the aged, and which has been denominated "miniature decrepitude." The skin loses the smoothness and freshness of early life, and is wrinkled and sallow; the cheeks and eyes are sunken; the borders of the mouth are thrown into radiated folds, as if drawn together with a purse-string; the palms of the hands and soles of the feet are dry, wrinkled, and often chapped; and the general aspect of the child is one of premature old age. In many cases, the skin assumes a peculiar bistre tint, which is regarded as quite cha-

[1] Discussion on Hereditary Syphilis before the Soc. de Chirurg., Session of May 31, 1854.

[2] De la Contagion Syphilitique, p. 11.

[3] Discussion before the Académie Impériale de Médecine, Session of Oct. 8, 1858

[4] See p. 573.

racteristic of congenital syphilis by Trousseau, who describes it as follows: "The bistre tint is rarely absent, though it varies in extent, in intensity, and in the time of its appearance. Sometimes it occupies nearly the whole surface of the skin, but even then is most decided in its seat of election; at other times it is confined to the face, certain portions of which are most apt to be affected. As a general rule, it is less marked the more widely it is diffused. Its favorite seat is upon the lower portion of the forehead, the nose, the eyelids, and the most prominent portions of the cheeks. The deeper parts, as the internal angle of the orbit, the hollow of the cheeks, and the depression which separates the lower lip from the chin, are almost always exempt, but no invariable limits can be assigned to it."[1]

Coryza.—This is one of the earliest and most frequent manifestations of congenital syphilis, and, in a few instances, is the only symptom present. It commences with a thin serous discharge from the nostrils, the margins of which are observed to be reddened, and covered with small pustules, mucous patches, or fissures. As the disease progresses, the discharge becomes purulent and sanious; the nasal passages are obstructed by the desiccation of matter and the formation of scabs; respiration is attended with a peculiar snuffling, which is very characteristic of this affection; and the impossibility of breathing freely through the nose seriously interferes with or altogether prevents suction at the breast; thus the nutrition of the child is impaired, and death sometimes occurs from inanition. In severe cases, the osseous and cartilaginous tissues are attacked; small fragments of necrosed bone come away with the discharge, and the septum nasi may be perforated, or the nose sunken. The disease sometimes involves the throat and larynx, and renders the voice hoarse or almost inaudible. Syphilitic coryza commences in the mucous membrane, which, as shown by Diday, is the seat of mucous patches or pustules similar to those found upon other mucous surfaces. These are succeeded by ulcerations which involve the bones and cartilages secondarily.

Affections of the Skin and Mucous Membranes.—A still more frequent and characteristic symptom of congenital syphilis, and one which is very rarely wanting, is an eruption of *mucous patches*. In infants, as well as in adults, the favorite seat of this eruption is in the neighborhood of the outlets of mucous canals, and especially in the vicinity of the anus; but, owing to the general moisture of the

[1] Arch. Gén. de Méd., 4e série, t. xv., p. 159, 1847.

integument at this early age, mucous patches are often much more extended than in adults, and may occur upon any part of the surface. They are most frequent upon the nates, scrotum, vulva, thighs, around the umbilicus, in the axillæ, behind the ears, and upon the labial commissures; they are also seen upon the hairy scalp, where they are never met with in adults. They are generally distinct upon the thighs and trunk, but are often confluent in the genito-crural fold and around the margin of the anus, and in the latter situation frequently become ulcerated, and give rise to rhagades or fissures which radiate from the anal orifice. They exhale a very offensive and characteristic odor, especially if attention to cleanliness be neglected.

When seated upon a mucous surface, these patches present an opaline appearance, as if pencilled over with a crayon of nitrate of silver. They are rare upon the tongue, but frequent upon the internal surface of the lips and cheeks, at the base of the gums, and upon the fauces, and in these situations are a common source of contagion from the infant to the nurse. Whether seated upon the skin or mucous membranes, the appearance of this eruption does not materially differ from that already described in a previous chapter.

Syphilitic erythema is rare in the subjects of congenital syphilis, although a number of cases have been reported. Bassereau mentions an instance, in which red spots appeared upon the brow and cheeks the third day after birth, and presented the copper color and slight elevation peculiar to the papular form of syphilitic erythema. Syphilitic coryza appeared upon the fourth day, and the infant died at the end of a fortnight.[1]

Pemphigus, unlike other syphilitic eruptions, is frequently present at birth. It is characterized by large vesicles, filled with yellowish serum often mixed with blood, and resting upon violet-colored or bluish patches of integument. Its favorite seat is upon the palms of the hands and soles of the feet, although it sometimes occurs elsewhere. In most cases, some of the vesicles have been ruptured previous to the birth of the child, and the underlying skin is found to be reddened and superficially eroded, or, in some instances, more or less deeply ulcerated. The prognosis is exceedingly unfavorable, since death ensues in the great majority of cases. In other instances, syphilitic pemphigus does not make its appearance until a few hours or days after birth, and, if the child survives, the erup-

[1] Op. cit., p. 541.

tion usually disappears within three weeks. There has been no little discussion whether the pemphigoid eruption of infants is to be regarded as the immediate result of syphilis, or as the consequence of the general cachexia produced by the inherited taint; this question, however, is of minor importance, since the eruption is rarely, if ever, met with in the offspring of other than syphilitic parents.

Other syphilitic eruptions occurring in the subjects of congenital syphilis are pustules (syphilitic impetigo and ecthyma), and deep tubercles of the cellular tissue. Syphilitic papulæ and squamæ, and the non-ulcerated form of tubercles, are rare at this age.

Onychia.—Syphilitic onychia is sometimes observed in infants, but is rarer than in adults.

Suppuration of the Thymus Gland.—Paul Dubois,[1] in 1850, first called attention to certain pathological changes which are found in the thymus glands of infants who are born dead, or who die a few days after birth from inherited syphilis. Externally, the gland appears to be normal in size, color, and consistency; but if an incision be made into its substance, pressure will cause to exude from the cut surface a few drops of yellowish fluid, which, under the microscope, is found to consist of pus. In the cases observed by Dubois, the purulent matter was uniformly diffused throughout the glandular tissue; but Depaul,[2] Weber,[3] and Hecker[4] have met with abscesses of the thymus. The thymus gland naturally contains a whitish, viscid fluid, which may, with a little care, be distinguished from the suppuration dependent upon syphilis. Of five cases of this lesion observed by Dubois and Depaul, an eruption of pemphigus was present in four; and in the same number the syphilitic antecedents of the parents were clearly established. Virchow[5] mentions a case reported by Lehmann, in which tuberosities of the conjunctive tissue, which had undergone fatty degeneration, were found in the thymus glands, the dura mater, and the liver, but the history of the parents could not be ascertained with certainty.

Changes in the Lungs.—In 1851, Depaul called the attention of the profession to peculiar masses of induration which he found in the lungs of infants affected with congenital syphilis. Specimens of this

[1] Gaz. Méd. de Paris, 1850, p. 392.
[2] Gaz. Méd. de Paris, 1851.
[3] Beiträge zur Path. Anat. der Neugeboren. Kiel, 1852, vol. ii., p. 75.
[4] Verhandl. der Berliner Gesells. für Geburtshülfe, vol. viii., p. 117.
[5] La Syphilis Constitutionnelle, p. 158.

lesion furnished by Depaul were submitted by the Anatomical Society of Paris to Lebert for examination, who reported upon them as follows: "There is no trace of pus in the masses of induration. The tissue presents a peculiar yellow color, and is elastic and resistant. In the midst of a network of the normal pulmonary tissue we find, mingled with fibro-plastic elements, a soft, pulpy, diffused substance, containing small cells, which differ from those of cancer and of tubercle, and which resemble in every respect those seen in syphilitic gummata. These specimens may, therefore, be regarded as an early stage of pulmonary gummata, which first appear as indurated masses, and afterwards assume a yellowish and pulpy appearance, and finally soften so as to resemble purulent infiltration or abscesses."[1] In his *Treatise upon Pathological Anatomy*, Lebert gives a plate of one of these masses of induration, which he compares to certain changes produced by pneumonia.[2]

Virchow thus describes the results of his post-mortem investigations: "At Würzburg, where hereditary syphilis is very common, I have found a large number of children die in consequence of a peculiar form of broncho-pneumonia. Microscopical examination has shown the existence of a dry and resistant substance, very analogous to tubercular infiltration, which was inclosed in the pulmonary alveoli and consisted of cells pressed against each other, and for the most part puriform. The larger portion of this substance speedily underwent fatty metamorphosis, and remained in the pulmonary vesicles in the form of granular detritus. But I have also observed this lesion independent of any direct connection with syphilis. In children who were simply atrophied, I have found in many cases quite an abundant infiltration around the bronchi, where they penetrate into the pulmonary lobules, together with granular collections and abscesses, perfectly resembling what is called tubercle, and also distributed in the lungs. At present, it is difficult to determine how we are to recognize the syphilitic character of such pneumonias; and I forbear from expressing an opinion upon certain cicatricial and caseous lesions, some of which are very probably due to syphilis."[3]

Changes in the Liver.—Of the various changes in the viscera which have been ascribed to syphilis, there is the least doubt respecting those occurring in the liver which were first noticed by Gubler in

[1] Bulletin de la Soc. Anatomique, 1852, p. 23.

[2] Traité d'Anatomie Pathologique, Pl. XIII., Figs. 3 and 4.

[3] Op. cit., p. 156.

1848.[1] Diday's description of this lesion is so clear and complete, that I shall avail myself of it.

"When the lesion has reached its maximum, the liver is sensibly hypertrophied, globular, and hard. It is resistant to pressure, and even when torn by the fingers its surface receives no indentation from them. The elasticity of the organ is such, that if a wedge-shaped piece taken from its thin edge be pressed, it escapes like a cherry-stone, and rebounds from the ground. When cut into, it creaks slightly under the scalpel. The distinct nature of its two substances has completely vanished. On a uniform yellowish ground, a more or less close layer of small, white, opaque grains is seen, having the appearance of grains of semola, with delicate arborescences, formed of empty bloodvessels. On pressure no blood is forced out, but only a slightly yellow serum, which is derived from the albumen. Gubler has only three times seen the change carried to this extent. It is most frequently much less marked. Thus, the tissue of the organ is firm, without having that extreme hardness and yellow color, which might admit of comparison to some kinds of flint. The interior of the organ presents rather an indefinite color, shaded with yellow or brownish-red, more or less diluted; but in no part is the parenchyma quite healthy in appearance.

"Again, the change may be found in circumscribed parts only. Gubler has seen it confined to the left lobe, to the thin edge of the right lobe, and to the *lobulus Spigelii*. He ascertained by injections that, in the indurated tissue, the vascular network is almost impermeable; that the capillary vessels are obliterated, and that even the calibre of the larger vessels is considerably diminished. Microscopical examination enabled him to discover the cause of this disposition by revealing in the altered tissue of the organ, in every degree of change, the presence of fibro-plastic matter, sometimes in considerable, sometimes in enormous quantity. In the portions intervening between the diseased parts, the cells of the hepatic parenchyma maintain all the characteristics of their normal condition. The physical consequences of the deposit of these elements are an increase in the volume of the liver, the compression of the cells of the *acini*, the obliteration of the vessels, and the consequent cessation of the secretion of bile. In all the subjects examined after death by Gubler, he always found the bile in the gall-bladder of a pale yellow color and very sticky; that is to say, very rich in mucus and very poor in coloring matter.

[1] Gaz. des Hôp., 1848.

"The blood had almost always undergone a marked change, its solid portion having the consistence of soft currant jelly, and the fluid portion being unusually abundant. In one subject this change coincided with an extreme discoloration of all the tissues and with innumerable ecchymoses. In one case the lungs presented the characters of acute pneumonia, and in two that of chronic or pancreatiform pneumonia. Lastly, the concomitant syphilitic lesions consisted in patches of psoriasis, pustules of lenticular ecthyma, mucous patches, fissures at the circumference of the natural outlets, and in the folds about the joints, and inflammation of the nasal fossæ, with purulent and sanguineous secretion."[1]

Gubler regards this lesion as of the same nature as gummy tumors, and consequently classifies it among tertiary symptoms. Diday, on the other hand, looks upon induration of the liver as identical with that of the base of the chancre and neighboring ganglia, and therefore assigns its place among secondary lesions. The fact that it yields most readily to mercurials appears to favor the latter classification.

The symptoms of this affection, so far as they have been determined, are excessive restlessness of the infant, who is apparently in great pain, vomiting and diarrhœa, or constipation, swelling and tenderness of the abdomen, and a small and quick pulse. By palpation and percussion, an increase in the volume and density of the liver may, perhaps, be ascertained. Jaundice has never been noted in any of the reported cases; although, according to Emile Vidal,[2] Gubler has met with one instance not yet published. The prognosis in this affection is very unfavorable, and death generally ensues in a very few days.

Peritonitis.—Prof. Simpson,[3] of Edinburgh, in a large proportion of the cases in which the children of syphilitic parents die during the latter months of pregnancy, ascribes the mortality to peritonitis; farther observation, however, is requisite to determine whether congenital syphilis is capable of producing simple peritonitis independently of induration of the liver, with which it was associated in some of Gubler's cases.

Affections of the Periosteum and Bones.—These affections, although occasionally met with as an effect of congenital syphilis, are confessedly rare. In addition to the cases already given in the present work, the following have been reported.

[1] Syphilis in New-born Children; Sydenham Society's translation, p. 92.
[2] De la Syphilis Congénitale, Paris, 1860, p. 32.
[3] Obstetric Memoirs, Edinb., 1856, vol. ii., p. 172.

Underwood[1] saw an exostosis upon the cranium of a child, born of a syphilitic mother who had been infected by her husband.

Bertin[2] met with a periostosis upon the superior and posterior surface of the cubitus, in an infant thirty-five days old, whose body was covered with pustules.

Laborie[3] mentions a case of caries of the tibia in a subject of congenital pemphigus.

Cruveilhier[4] speaks of a child born at full term, poorly developed, with pustules on different parts of the body, in whom the dura mater, corresponding to the angle of union of the frontal bones with the superior walls of the orbits, was infiltrated with pus, and the bones themselves denuded and eroded in a part of their thickness.

Bouchut[5] has described an affection of the long bones, differing from caries and degeneration of the periosteum, which he states he has often observed in the subjects of inherited syphilis. Instead of the soft, spongy, vascular, imperfectly formed and easily cut structure of the bones at this age, he has found the middle portions of the tibiæ and femora, solid, compact, eburnated, and not to be broken or divided by a cutting instrument. Bouchut supposes that these changes indicate an abnormal activity in the development of bony tissue, similar to the plastic exudation which takes place in other organs.

Hydrocephalus.—Hydrocephalus has been attributed to an inherited syphilitic taint by Gros and Lancereaux,[6] Rayer, Haase,[7] and De Méric;[8] and several cases have been reported in which the connection as cause and effect between these two diseases has appeared to be highly probable.

Affections of the Supra-renal Capsules and Pancreas.—Virchow[9] states that he has met with an increase of volume and complete fatty degeneration of the supra-renal capsules, and also fatty degeneration of the pancreas, in infants affected with congenital syphilis.

PROGNOSIS.—The mortality from congenital is undoubtedly much greater than from acquired syphilis, although statistics to determine

[1] Traité des Mal. des Enfants, Paris, 1786, p. 361.
[2] Traité de la Mal. Vénér. chez les Enfants Nouveau-nés, p. 69.
[3] Session of the Acad. de Méd., July 1, 1857.
[4] Anatomie Pathologique, 10th obs.
[5] Traité Pratique des Mal. des Nouveaux-nés, 1854, p. 863.
[6] Mémoire crowned by the Academy, 1859 (as quoted by Emile Vidal, op. cit., p. 33.)
[7] Allgemein. Medic. Annal., Feb. 1829, p. 194.
[8] Lettsomian Lectures, 1858, p. 65.
[9] La Syphilis Constitutionnelle, p. 161.

the exact proportion of deaths are wanting. Bassereau[1] says that an examination of his notes and of cases reported by others leads him to believe that in at least one-third, death ensues within a few months after birth. Trousseau[2] has never seen an infant recover when the disease appeared within a few days after delivery.

TREATMENT.—The propriety of treating a pregnant woman for syphilis has been the subject of much discussion, and has, at times, been denied on the ground that mercury was a powerful cause of abortion, and that the death and expulsion of the fœtus was more frequently due to the administration of this mineral than to syphilis itself. It would serve no useful purpose to enter into the arguments which have been advanced for and against this supposition; suffice it to say that modern surgeons, with but few exceptions, regard the fear referred to as chimerical, and believe that specific treatment of the mother is the surest means of prolonging gestation to its full term and of affording security to the infant after birth. Ricord's views upon this subject are very explicit and decided. He says: "The period of gestation in women, far from contraindicating energetic treatment, demands increased attention and promptitude within the bounds of prudence. I have seen very many more abortions among syphilitic women who had not been treated, than among those who, taken in time, had been subjected to methodical medication."

There is strong ground for believing that in those cases in which mercurials have appeared to favor abortion, they have done so only in consequence of their irritant effect upon the intestinal canal, and not from any abortive power inherent in the remedy itself. Thus, six cases reported by Colson[3] of abortion in pregnant women who were subjected to mercurial treatment, were analyzed by Bertin,[4] who showed that in four there was violent vomiting, and in a fifth convulsions at the sixth month of pregnancy; while in the remaining case treatment had been commenced only a fortnight before, and sufficient time had not elapsed to obtain its full effect; hence, that in none was there reason to ascribe the death of the fœtus to the judicious employment of mercury.

The sympathy existing between the intestinal canal and the uterus

[1] Op. cit., p. 544.

[2] Leçons sur la Syphilis Congénitale, Union Médicale, 1857.

[3] Arch. Gén. de Méd., 4th series, t. xviii., p. 24.

[4] Comte Rendu des Travaux de la Soc. de Méd. de Bruxelles, 1858, p. 82 (as quoted by Emile Vidal, op. cit., p. 84.)

is well known, and in the treatment of pregnant women affected with syphilis, we should carefully guard against any irritant action upon the stomach or bowels. Fortunately, this end may be accomplished, and at the same time the full action of the remedy be obtained by mercurial inunction, which is by far the best method of treatment in such cases. The same opinion was expressed a long time ago by Bell, who said: "During pregnancy, mercury ought in every instance to be used in the form of unction, as we thereby with most certainty prevent it from acting upon the stomach and bowels, and thus avoid the hazard of abortion taking place as the effect of irritation upon these parts. Nothing, indeed, more readily excites abortion than purgatives when severe in their operation upon the bowels, or when they even only produce any considerable degree of tenesmus; and as the internal exhibition of mercury is frequently the cause of this, it cannot but with much hazard be given in any considerable quantity during pregnancy."[1]

When the father is known to have been the subject of syphilitic manifestations at the time of impregnation, or when previous abortions afford reason for supposing that the disease, although apparently latent in him, has still been active enough to infect the ovum, it is the part of prudence to subject the mother to treatment during pregnancy, in the same manner as if she herself had presented syphilitic symptoms.

The same method of treatment above recommended for the mother, viz., mercurial inunction, is no less appropriate for an infant affected with congenital syphilis. The internal administration of mercury, as in one of the accompanying formulæ, will sometimes succeed, but too frequently irritates the bowels, and, in my own experience, affords far less satisfactory results than the method by inunction.

℞. Hydrargyri cum cretâ gr.ij–vj.
Sacchari albi gr. xij.
M. et div. in ch. No xii.
One three times a day.

℞. Hydrarg. chloridi corrosivi gr. ss–j.
Ammoniæ muriatis gr. iij.
Syrupi papaveris ℥ij.
Aquæ ℥iv.
M. A teaspoonful three times a day.

Van Swieten's solution and Plenck's gummy mercury[2] are often used by the French, who also employ baths containing from half a

[1] A Treatise on Gonorrhœa Virulenta, &c., Edinb., 1793, vol. ii., p. 435.

[2] "Plenck's gummy mercury" contains mercury gr. xv, powdered gum Arabic gr. xlv, and syrup of diacode (an electuary containing a small quantity of extract of poppies) ʒj. Triturate in a porcelain mortar until the mercury disappears. *Dose.*—ʒss in an appropriate vehicle. (Diday.)

drachm to a drachm of the bichloride of mercury. My own preferences are in favor of the gray powder for internal administration.

The advantages of mercurial inunction and the method of employing it are thus set forth by Sir Benjamin Brodie:[1] "The mode in which I have treated these cases for some years past has been this: I have spread mercurial ointment made in the proportion of a drachm to an ounce, over a flannnel roller, and bound it round the child once a day. The child kicks about, and, the cuticle being thin, the mercury is absorbed. It does not either gripe or purge, nor does it make the gums sore, but it cures the disease. I have adopted this practice in a great many cases with the most signal success. Very few children recover in whom mercury is given internally, but I have not seen a case where this method has failed."

Treatment should by no means be laid aside as soon as all syphilitic manifestations have disappeared, but should be continued as a prophylactic for several months afterwards.

Indirect treatment by means of remedies administered to the child's nurse is not to be depended upon in a disease which makes such rapid progress and is so destructive in its tendency as congenital syphilis. MM. Lutz and Personne have carefully analyzed the milk of nurses who were subjected to mercurial treatment pushed in some instances to salivation, without being able to discover the slightest trace of this mineral. Experiments upon animals, however, have shown that a very minute quantity of mercury may be detected in the milk of a goat that has been salivated by mercurial inunction, and cases have been reported in which infants have been cured of syphilis by being fed upon milk derived from such a source; but this method, for obvious reasons, could not be generally adopted, even if its efficacy were fully established.

The administration of iodide of potassium to the infant's nurse may be resorted to with much greater probability of the remedy finding its way into the mammary secretion, and may often be employed with advantage as an adjuvant to the direct treatment of the child.

The local treatment of syphilitic symptoms is the same in the child as in the adult; but the utmost cleanliness should be maintained, and the affected parts be carefully preserved from contact with the urine and feces.

[1] Clinical Lectures on Surgery, Phil. ed., 1846, p. 280.

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